

MODULE OVERVIEW

This module describes the types and uses of drawings prepared for commercial structures. It provides information about the format and content of commercial drawings and their use in conveying specific construction requirements. It describes the standard format for specifications.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Carpentry Fundamentals Level One*.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Recognize the difference between commercial and residential construction drawings.
2. Identify the basic keys, abbreviations, and other references contained in a set of commercial drawings.
3. Accurately read a set of commercial drawings.
4. Identify and document specific items from a door and window schedule.
5. Explain basic construction details and concepts employed in commercial construction.
6. Calculate the floor area of each room in a floor plan.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Locate 10 items contained in a set of commercial drawings. (The instructor will select the 10 items.)
2. Using a door and window schedule, identify the hardware, ratings, and finishing for each door and window.
3. Calculate the floor area in a floor plan.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	Appropriate personal protective equipment
Pencils and scratch paper	Set of commercial drawings
Whiteboard/chalkboard	Set of residential drawings
<i>Carpentry Level Two</i> PowerPoint® Presentation	Copies of Quick Quizzes*
Slides (ISBN 978-0-13-229138-5)	Module Examination**
Multimedia projector and screen	Performance Profile Sheets**
Computer	

* Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

The American Institute of Architects, *Architectural Graphic Standards*, Eighth Edition. New York: Wiley, 1988.

continued

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Commercial Drawings*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction to the Drawing Set	
A. Introduction	_____
B. Requirements for Commercial Plans	_____
Sessions II through IV. Reading and Understanding Drawings I	
A. Architectural Drawings	_____
B. Laboratory	_____
Trainees practice calculating the area of each room in a floor plan in a set of commercial drawings. This laboratory corresponds to Performance Task 3.	
C. Schedules	_____
D. Laboratory	_____
Trainees practice using a door and window schedule. This laboratory corresponds to Performance Task 2.	
Sessions V and VI. Reading and Understanding Drawings II	
A. Structural Drawings	_____
Sessions VII and VIII. Reading and Understanding Drawings III	
A. Mechanical Drawings	_____
B. Electrical Drawings	_____
C. Laboratory	_____
Trainees practice identifying and documenting the design and location of ten items contained in a set of commercial drawings. This laboratory corresponds to Performance Task 1.	
Session IX. Understanding Written Specifications	
A. Written Specifications	_____
Session X. Review and Testing	
A. Module Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module covers the common materials used in residential and light commercial roofing, along with the safety practices and application methods for these materials. It includes shingles, roll roofing, shakes, tiles, and metal and membrane roofs, as well as the selection and installation of roof vents.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Module 27201-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the materials and methods used in roofing.
2. Explain the safety requirements for roof jobs.
3. Install fiberglass shingles on gable and hip roofs.
4. Close up a valley using fiberglass shingles.
5. Explain how to make various roof projections watertight when using fiberglass shingles.
6. Complete the proper cuts and install the main and hip ridge caps using fiberglass shingles.
7. Lay out, cut, and install a cricket or saddle.
8. Install wood shingles and shakes on roofs.
9. Describe how to close up a valley using wood shingles and shakes.
10. Explain how to make roof projections watertight when using wood shakes and shingles.
11. Complete the cuts and install the main and hip ridge caps using wood shakes/shingles.
12. Demonstrate the techniques for installing other selected types of roofing materials.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install fiberglass shingles on gable and hip roofs.
2. Close up a valley using fiberglass shingles.
3. Complete the proper cuts and install the main and hip ridge caps using fiberglass shingles.
4. Lay out, cut, and install a cricket or saddle.
5. Install wood shingles and shakes on roofs.
6. Complete the cuts and install the main and hip ridge caps using shakes/shingles.
7. Demonstrate the techniques for installing other selected types of roofing materials.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	Hardboard simulated shingle panels
Pencils and scratch paper	Metal simulated shingle panels
Whiteboard/chalkboard	Slate shingles
<i>Carpentry Level Two</i> PowerPoint® Presentation Slides (ISBN 978-0-13-229138-5)	Roofing tiles
Multimedia projector and screen	Metal roofing
Computer	Synthetic tiles, shakes, and shingles
Appropriate personal protective equipment	Membrane roofing
Composition shingles	Corrugated metal roofing
Architectural shingles	Installation literature on standing-seam metal roofing
Roll roofing material	Scaffolding tags
Wood roofing shingles	Roofing brackets
Wood roofing shakes	Metal drip edge
Wood shingle panels	Flashing

continued

Fiberglass shingles	Power drill
Torch-down roofing material	Caulking gun
Single-ply roofing material	Tin snips
Ice edging	Pry bar
Prepared roof deck for composite shingles with a valley, hip roof intersection, horizontal abutment, and sidewall (all sheathed and with underlay in place)	Utility knife
Prepared roof deck for wood shingles with spaced sheathing and hip roof intersection	Scribing compass
Prepared low-pitch (flat roof) roof with sheathing in place	Drill bit set (regular and masonry)
2 × 4s to build saddle	Framing square
Roofing nails	Claw hammer
Plastic cement	Pneumatic nail guns
Felt underlayment	Shingle hatchet
Weatherproof membrane	Straightedge
Prefabricated soil pipe flashing	Composition shingle knife
Backsaw	Roofing hammer
Power circular saw	Slater's tools
Crowbar	Score and snap tile cutter
Handsaw	Hand grinder with diamond wheel
Carpenter's level	Portable metal brake
Nail apron	Margin trowel
Sliding T-bevel	Scaffolding
Keyhole saw	Materials moving equipment
Pop riveter	Ladders and jacks
Chalkline	Full body harness with lanyard and deceleration devices
Power saber saw	Damaged personal fall protection equipment
Angle square	Propane torch and tank
	Copies of the Quick Quiz*
	Module Examinations**
	Performance Profile Sheets**

* Located at the back of this module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that all trainees are briefed on job site safety. This module requires trainees to install roofing. Ensure that all trainees are briefed on tool safety, shop safety, and fall protection as required.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Asphalt Manufacturers Association website, www.asphaltroofing.org
 National Roofing Contractors Association website, www.ncra.net
 Roof Coating Manufacturers Association website, www.roofcoating.org

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Roofing Applications*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction and Typical Roofing Materials	
A. Introduction	_____
B. Typical Roofing Materials	_____
C. Laboratory	_____
Trainees practice identifying typical roofing materials.	
Session II. Tools and Safety	
A. Tools	_____
B. Safety	_____
C. Laboratory	_____
Trainees practice donning safety equipment.	
Sessions III through V. Preparation for Roofing Applications, Composition Shingle Installation	
A. Preparation for Roofing Applications	_____
B. Composition Shingle Installation: Gable and Hip Roofs	_____
C. Laboratory	_____
Trainees practice installing fiberglass shingles on gable and hip roofs. This laboratory corresponds to Performance Task 1.	
D. Composition Shingle Installation: Valleys	_____
E. Laboratory	_____
Trainees practice closing up a valley using fiberglass shingles. This laboratory corresponds to Performance Task 2.	
F. Composition Shingle Installation: Roof Projections and Flashing	_____
G. Laboratory	_____
Trainees practice installing a cricket or saddle. This laboratory corresponds to Performance Task 4.	
H. Laboratory	_____
Trainees practice installing the main and hip ridge caps using fiberglass shingles. This laboratory corresponds to Performance Task 3.	
Sessions VI and VII. Alternative Roofing Materials I	
A. Roll Roofing Installation	_____
B. Wood Shingles and Shakes	_____
C. Laboratory	_____
Trainees practice installing wood shingles and shakes. This laboratory corresponds to Performance Task 5.	
D. Laboratory	_____
Trainees practice installing the main and hip ridge caps using wood shakes/shingles. This laboratory corresponds to Performance Task 6.	

Sessions VIII and IX. Alternative Roofing Materials II

- A. Common Metal Roofing
- B. Slate and Tile Roofing
- C. Single-Ply Roofing Application
- D. Torch-Down Roofing Application
- E. Laboratory

Trainees practice installing other selected types of roofing materials. This laboratory corresponds to Performance Task 7.

Session X. Ventilation and Ice Edging, Review, and Testing

- A. Roof Ventilation and Ice Edging
- B. Module Review
- C. Module Examination
 - 1. Trainees must score 70% or higher to receive recognition from NCCER.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.
- D. Performance Testing
 - 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module covers the selection and installation of various types of insulating materials in walls, floors, and attics. It also covers the uses and installation practices for vapor barriers and weather-proofing materials.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 and 27202-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe the requirements for insulation.
2. Describe the characteristics of various types of insulation material.
3. Calculate the required amounts of insulation for a structure.
4. Install selected insulation materials.
5. Describe the requirements for moisture control and ventilation.
6. Install selected vapor barriers.
7. Describe various methods of waterproofing.
8. Describe air infiltration control requirements.
9. Install selected building wraps.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install blanket insulation in a wall.
2. Install a vapor barrier on a wall.
3. Install selected building wraps.

MATERIALS AND EQUIPMENT LIST

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Carpentry Level Two PowerPoint® Presentation Slides (ISBN 978-0-13-229138-5)
Multimedia projector and screen
Computer
Appropriate personal protective equipment
Flexible insulation
Loose-fill insulation
Rigid or semi-rigid insulation boards
Reflective insulation
Staples
Hand or power stapler

Calculator
Samples of various vapor barrier materials
Samples of various waterproofing materials
Soffit baffles
Wire mesh if needed
Tape measure
Utility knife or shears
Pencil
Prepared wall for insulation, vapor barriers, and building wraps
Copies of the Quick Quiz*
Module Examinations**
Performance Profile Sheets**

* Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to install insulation materials. Ensure that they are properly briefed on the use of all tools and personal protection necessary to handle insulation materials.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

International Energy Conservation Code[®]. International Code Council, 2006.
U.S. Department of Energy Website, www.eere.energy.gov

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 7½ hours are suggested to cover *Thermal and Moisture Protection*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction to Thermal Insulation	
A. Introduction	_____
B. Thermal Insulation	_____
C. Insulation Installation Guidelines	_____
D. Laboratory	_____
Trainees practice installing blanket insulation in a wall. This laboratory corresponds to Performance Task 1.	
Session II. Moisture Control and Air Infiltration Control	
A. Moisture Control	_____
B. Laboratory	_____
Trainees practice installing a vapor barrier on a wall. This laboratory corresponds to Performance Task 2.	
C. Waterproofing	_____
D. Air Infiltration Control	_____
E. Laboratory	_____
Trainees practice installing selected building wraps. This laboratory corresponds to Performance Task 3.	
Session III. Review and Testing	
A. Module Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module covers the various types of exterior siding used in residential construction including wood, metal, vinyl, and cement board siding, and their installation procedures.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27203-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe the purpose of wall insulation and flashing.
2. Install selected common cornices.
3. Demonstrate lap and panel siding estimating methods.
4. Describe the types and applications of common wood siding.
5. Describe fiber-cement siding and its uses.
6. Describe the types and styles of vinyl and metal siding.
7. Describe the types and applications of stucco and masonry veneer finishes.
8. Describe the types and applications of special exterior finish systems.
9. Install three types of siding commonly used in your area.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install a selected cornice or box cornice using the proper safety precautions.
2. Estimate the amount of lap or panel siding required for a structure.
3. Install three of the most common siding types in your area.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	Samples of various types of wood siding
Pencils and scratch paper	Nails used to secure wood siding
Whiteboard/chalkboard	Samples of vinyl or metal siding
<i>Carpentry Level Two</i> PowerPoint® Presentation Slides (ISBN 978-0-13-229138-5)	Manufacturer's installation instructions for metal and vinyl siding
Multimedia projector and screen	Quantity of one style of vinyl or metal siding
Computer	Various manufactured vinyl or metal siding trim and starter components
Sample of building wrap	Metal and PVC trim coils
MSDS	Samples of various stucco, brick, stone, and synthetic stone veneer
Samples of aluminum and vinyl fascia and soffits and installation instructions	Samples of DEFS/EIFS wall cladding
2 × 4s with different types of tail rafter cuts	1 × 3s for story poles
2 × 4s for lookouts	6" bevel wood siding and/or wood lap siding
2 × 4s for lookout ledger	Board-and-batten siding
2 × 6s for false fascia	Tongue-and-groove siding
1 × 8s for fascia	Shiplap siding
1 × 2s for frieze	Shingles and shakes
Plywood for soffit	Panelized shake or shingle siding
Galvanized 4d box nails for soffit	4 × 8 plywood siding
Galvanized 8d casing nails for fascia	4 × 8 panel and lap-style hardboard/particleboard siding
8d box nails for lookout ledger	
16d box nails for lookouts	

continued

Lap and panel styles of fiber-cement siding
Manufacturer's installation instructions for
fiber-cement siding
Manufacturer's installation instructions for
plywood siding
Caulk
Inside and outside corner materials
Furring strips for starter course
Spacing gauges (fabricated)
Siding gauges (fabricated)
Drip caps
Flashing
Building paper
Nails
Radial arm saw
Framing square
Steel measuring tape
Claw hammer
4' level
Handsaw
Chalkline
Combination square
Water level

Circular saw or table saw
Fine-toothed, carbide-tipped, circular saw blade
Dry-diamond circular saw blade
Sawhorses or cutting table
Electric/pneumatic carbide-tipped power hand
shears
Score-and-snap knife with tungsten carbide tip
Caulking gun
Pliers
Tin snips
Aviation shears
Steel awl
Putty knife
Utility knife
Snaplock punch
Vinyl siding unlocking tool
Nail hole punch
Flat-blade screwdriver
Portable brake
Copies of the Quick Quiz*
Module Examinations**
Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to perform exterior finishing. Ensure that all trainees are properly briefed on site safety procedures and tool safety.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

The Vinyl Siding Institute website, www.vinylsiding.org
Cedar Shake & Shingle Bureau website, www.cedarbureau.org

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 35 hours are suggested to cover *Exterior Finishing*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Insulation, Flashing, and Cornices	
A. Introduction	_____
B. Safety	_____
C. Insulation	_____
D. Flashing	_____
E. Cornices	_____
F. Laboratory	_____
Trainees practice installing a cornice. This laboratory corresponds to Performance Task 1.	
Session III. Estimating	
A. Estimating Panel and Board Siding	_____
B. Laboratory	_____
Trainees practice estimating the amount of lap or panel siding required for a structure. This laboratory corresponds to Performance Task 2.	
Sessions IV through VII. Wood Siding	
A. Beveled Siding	_____
B. Board-and-Batten Siding	_____
C. Tongue-and-Groove Siding	_____
D. Shingle Siding or Shakes	_____
E. Plywood Siding	_____
F. Hardboard and Particleboard Siding	_____
G. Laboratory	_____
Trainees practice installing siding. This laboratory corresponds to Performance Task 3.	
Sessions VIII and IX. Fiber-Cement Siding	
A. Types	_____
B. Installation Procedures	_____
C. Laboratory	_____
Trainees practice installing siding. This laboratory corresponds to Performance Task 3.	
Sessions X through XII. Vinyl and Metal Siding	
A. Materials and Components	_____
B. Tools and Equipment	_____
C. Installation Procedures	_____
D. Laboratory	_____
Trainees practice installing siding. This laboratory corresponds to Performance Task 3.	

Session XIII. Exterior Finishes

- A. Stucco (Cement) Finishes
- B. Brick and Stone Veneer
- C. DEFS and EIFS

Session XIV. Review and Testing

- A. Module Review
- B. Module Examination
 1. Trainees must score 70% or higher to receive recognition from NCCER.
 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.
- C. Performance Testing
 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module describes the types and grades of steel framing materials and includes instructions for selecting and installing metal framing for interior walls, exterior walls, and partitions.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27204-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the components of a steel framing system.
2. Identify and select the tools and fasteners used in a steel framing system.
3. Identify applications for steel framing systems.
4. Demonstrate the ability to build back-to-back, box, and L-headers.
5. Lay out and install a steel stud structural wall with openings to include bracing and blocking.
6. Lay out and install a steel stud non-structural wall with openings to include blocking and bracing.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Demonstrate the ability to build headers (back-to-back, box, and L-header).
2. Lay out and install a steel stud structural wall with openings to include bracing and blocking.
3. Lay out and install a steel stud non-structural wall with openings to include blocking and bracing.

MATERIALS AND EQUIPMENT LIST

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Carpentry Level Two PowerPoint® Presentation
Slides (ISBN 978-0-13-229138-5)
Multimedia projector and screen
Computer
Appropriate personal protective equipment
Various hand tools used when framing with steel, including:
Powder-actuated stud driver
Hammer-driven stud driver
Power screwdriver
Locking pliers (Vise-Grip™ pliers)
Circular metal saw
Hole punches
Hole saw
End circuit nippers and metal snips
Channel stud shear
Metal lock fastener (crimper)
Hand level
Claw hammer
Framing square

Standard for Cold-Formed Steel—General Provisions
Various fasteners used with steel framing, including:
Self-tapping screws
Drywall screws
⅜", ½" Type S or S-12 pan head screws
½" Masonry nails
Various samples of steel framing and framing materials, including:
Studs
Runners/tracks
Metal furring channel and clips
Resilient channel
Cold-rolled channel
Metal door frames, anchors, and clips
Metal angles
Tie wire
Furring brackets for adjustable walls
Breakaway clips
Fine-gauge framing material
Snap-in and standard runner track
Stud shoes
Standard resilient clips
Resilient starter/finisher clips

continued

Plain drywall channel
Metal joists
Metal trusses
Marked steel framing members
Non-structural steel framing members and accessories
To the maximum extent possible, prebuilt samples to demonstrate techniques, including:
Curtain wall framing
Double top plate
Held-back partition
Metal stud secured to a steel beam
Metal stud attached to a metal channel
Window frame and header
Simple 90° radius wall

Combination wood/metal frame window
Metal stud wall secured to a concrete wall
Metal stud frame for glass wall
Chalkline
100' steel tape
Plumb bob
Floor plan
Door frame jack
Two 1" × 25-gauge metal straps
Red or yellow spray paint
Thin boards
Wood wedges and blocks
Copies of the Quick Quizzes*
Module Examinations**
Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to perform metal stud framing. Ensure that all trainees are properly briefed on the use of powder-activated tools and tool safety.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

www.steelframing.org

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Cold-Formed Steel Framing*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Tools, and Fasteners	
A. Introduction	_____
B. Tools Used for Steel Framing Work	_____
C. Fasteners	_____
D. Steel Framing Materials	_____
Sessions II–V. Steel Framing Applications	
A. Applications	_____
B. Framing Walls	_____
C. Floor and Roof Assemblies	_____
D. Bracing Steel Walls	_____
E. Non-Structural Wall Framing	_____
F. Slip Connections	_____
G. Laboratory	_____
Trainees practice building headers. This laboratory corresponds to Performance Task 1.	
H. Laboratory	_____
Trainees practice laying out and installing a steel stud structural wall. This laboratory corresponds to Performance Task 2.	
I. Laboratory	_____
Trainees practice laying out and installing a steel stud non-structural wall. This laboratory corresponds to Performance Task 3.	
Session VI. Review and Testing	
A. Module Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. It also contains detailed instructions for installing drywall on walls and ceilings, using nails, drywall screws, and adhesives. It also covers fire- and sound-rated walls.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27205-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the different types of drywall and their uses.
2. Select the type and thickness of drywall required for specific installations.
3. Select fasteners for drywall installation.
4. Explain the fastener schedules for different types of drywall installations.
5. Perform single-layer and multi-layer drywall installations using different types of fastening systems, including:
 - Nails
 - Drywall screws
 - Adhesives
6. Install gypsum drywall on steel studs.
7. Explain how soundproofing is achieved in drywall installations.
8. Estimate material quantities for a drywall installation.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install gypsum drywall panels on stud walls and ceilings using different types of fastening systems, including:
 - Nails
 - Screws
 - Adhesives
2. Install gypsum drywall panels on a steel wall.
3. Select the type and thickness of drywall required for specific installations and estimate material quantities for the installation.

MATERIALS AND EQUIPMENT LIST

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Carpentry Level Two PowerPoint® Presentation
Slides (ISBN 978-0-13-229138-5)
Multimedia projector and screen
Computer
Samples of common types of gypsum board
Samples of the various edges found on gypsum board
Drywall panels
Metal or vinyl corners
Samples of nails used to secure drywall

Nails
Screws
Samples of sound isolation and firestopping materials
Various types of adhesives
Adhesive
Various tools used for gypsum board application including:
Steel rule with cutting edge
4' T-square
Hook-bill knife
Utility saw
Power cutout tool

continued

Drywall or keyhole saw
 Gypsum board lifter
 Circle cutter
 Drywall hammer
 Nail pouch
 Drywall rasp
 Screw gun
 Drywall lift
 T-brace
 Several tools used to apply adhesives to gypsum board

Samples of corner beads and casings
 Local building codes
 Firestopping devices
 Samples of different types of firestopping material
 Calculators
 Copies of the Quick Quiz*
 Module Examinations**
 Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. If you require trainees to visit construction sites, ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to install drywall. Ensure that all trainees are properly briefed on safety procedures and tool safety. Ensure that all trainees are briefed on lifting safety and observe proper lifting procedures.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Gypsum Construction Handbook. Chicago: United States Gypsum Company, 2000.

Installing & Finishing Drywall, William Spence. New York: Sterling Publishing Company, Inc., 1998.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Drywall Installation*. You may need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Gypsum Board, and Tools	
A. Introduction	_____
B. Gypsum Board	_____
C. Tools Used for Gypsum Board Application	_____

Session II. Application of Gypsum Board

- A. Single-Ply and Multi-Ply Construction
- B. Job-Site Preparation
- C. Cutting and Fitting Preparation
- D. Drywall Fasteners—Nails
- E. Laboratory

Trainees practice installing drywall using nails. This laboratory corresponds to Performance Task 1.

- F. Drywall Fasteners—Screws
- G. Laboratory

Trainees practice installing drywall using screws. This laboratory corresponds to Performance Task 1.

Session III. Adhesives

- A. Adhesive
- B. Laboratory

Trainees practice installing drywall using adhesives. This laboratory corresponds to Performance Task 1.

Session IV. Multi-Ply Application and Metal Framing

- A. Multi-Ply Application
- B. Metal Framing
- C. Laboratory

Trainees practice installing drywall on a metal stud wall. This laboratory corresponds to Performance Task 2.

Session V. Special Applications

- A. Self-Supporting Partitions
- B. Non-Combustible Panels
- C. Resurfacing Existing Construction
- D. Corner Beads and Casings
- E. Fire-Rated and Sound-Rated Walls
- F. Moisture-Resistant Construction
- G. Estimating Drywall
- H. Laboratory

Trainees practice estimating drywall. This laboratory corresponds to Performance Task 3.

Session VI. Review and Testing

- A. Module Review
- B. Module Examination

1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

- C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module covers the materials, tools, and methods used to finish and patch gypsum drywall. It includes coverage of both automatic and manual taping and finishing methods.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27206-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. State the differences among the six levels of finish established by industry standards and distinguish a finish level by observation.
2. Identify the hand tools used in drywall finishing and demonstrate the ability to use these tools.
3. Identify the automatic tools used in drywall finishing.
4. Identify the materials used in drywall finishing and state the purpose and use of each type of material, including:
 - Compounds
 - Joint reinforcing tapes
 - Trim material
 - Textures and coatings
5. Properly finish drywall using hand tools.
6. Recognize various types of problems that occur in drywall finishes; identify the causes and correct methods for solving each type of problem.
7. Patch damaged drywall.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. State the differences among the six levels of finish established by industry standards and distinguish a finish level by observation.
2. Properly prepare the following compounds for use:
 - Taping compound
 - Topping compound
 - Premix
 - Quickset compound
3. Select the proper hand tools and perform the following:
 - Joint taping and finishing
 - Fastener spotting
 - Corner finishing
 - Sanding
4. Patch damaged drywall.

MATERIALS AND EQUIPMENT LIST

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Carpentry Level Two PowerPoint® Presentation
Slides (ISBN 978-0-13-229138-5)
Multimedia projector and screen
Computer
A Recommended Specification for Levels of Gypsum Board Finish
To the maximum extent possible, various samples of properly finished walls as defined in the Trainee Module, including:
Level 0
Level 1
Level 2
Level 3
Level 4
Level 5
Various types of joint reinforcing tape, including fiberglass, metal edge, and paper
Various compounds, including powder, premix, and quickset
Water
Mixing container
Mixing tools
Pieces of 2 × 4
Various trims, including corner bead with mesh flanges, L-bead, J-bead, and expansion joints
Various grades of sandpaper
Mesh cloth
Polyethylene sponges
Sanding tools

Various hand and automatic tools used to cut, hang, and finish drywall, including:
Straight edge or T-square
Utility knife
Drywall saw
Circle cutter
Drywall hammer
Caulking gun
Screwdriver
Broad knife
Joint trowel
Corner tool
Mud pan or hawk
Sanding block, pole sander, or electric sander
Sponge sander
Tape dispenser
Banjo
Putty knife
Mud mashers
Mud mixers
Automatic finishing tools
Vacuum sander
Various tools used for creating texture patterns
Corner roller
Corner plow
Samples of textured finishes
Samples of common finished joint problems
Samples of common compound problems
Copies of the Quick Quizzes*
Module Examinations**
Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. If you require trainees to visit construction sites, ensure that they are briefed on site safety procedures. This module requires trainees to finish drywall. Ensure that all trainees are properly briefed on safety procedures and tool safety. Ensure that all trainees are briefed on dust hazards and controlling dust.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Gypsum Construction Guide. Charlotte, NC: National Gypsum Company, 1994.

Gypsum Construction Handbook. Chicago: United States Gypsum Company, 2000.

Installing & Finishing Drywall, William Spence. New York: Sterling Publishing Company, Inc., 1998.

Painting and Decorating Craftsman's Manual and Textbook. Fairfax, VA: Painting and Decorating Contractors of America, 1995.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 12½ hours are suggested to cover *Drywall Finishing*. You may need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Standards, and Tools	
A. Introduction	_____
B. Finishing Standards	_____
C. Laboratory	_____
Trainees practice identifying various finishing standards. This laboratory corresponds to Performance Task 1.	
D. Finishing Tools	_____
Session II. Finishing Materials	
A. Finishing Materials	_____
B. Laboratory	_____
Trainees practice preparing various types of finishing compounds. This laboratory corresponds to Performance Task 2.	
Sessions III and IV. Finishing Procedures	
A. Finishing Procedures	_____
B. Laboratory	_____
Trainees practice selecting the proper tool and performing various finishing techniques. This laboratory corresponds to Performance Task 3.	
C. Problems and Remedies	_____
D. Laboratory	_____
Trainees practice patching drywall. This laboratory corresponds to Performance Task 4.	
Session V. Review and Testing	
A. Module Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module covers the installation of metal doors and related hardware in steel-framed, wood-framed, and masonry walls, along with their related hardware, such as locksets and door closers. It also covers the installation of wooden doors, folding doors, and pocket doors.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27207-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions.
2. Identify different types of interior doors.
3. Identify different types of interior door hardware and demonstrate the installation procedures for selected types.
4. Demonstrate the correct and safe use of the hand and power tools described in this module.
5. List and identify specific items included on a typical door schedule.
6. Demonstrate the procedure for placing and hanging a selected door.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install a selected metal frame door using the proper safety precautions.
2. Install a prehung door unit or door hanging system using the proper safety precautions.
3. Lay out and cut hinges in a wooden door.
4. Install a lockset and door closer using the proper safety precautions.
5. Install a bifold door using the proper safety precautions.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	Metal door with door light
Pencils and scratch paper	Fire door
Whiteboard/chalkboard	Manufactured prehung door units
<i>Carpentry Level Two</i> PowerPoint® Presentation Slides (ISBN 978-0-13-229138-5)	Interior locksets and manufacturer's installation instructions
Multimedia projector and screen	Cylindrical, heavy-duty, and mortise locksets
Computer	Multiple lock keying systems
Segments of flush hollow-core, solid-core, and panel doors	Electrical strikes
Door schedules	Electrical bolt locks
Assembled and unassembled metal door frames with molding and accessories	Electrical locksets/latches
Manufacturer's warranty and installation instructions for wood doors	Electromagnetic locks
Assortment of doors, including:	Delayed exit alert locks
Bifold doors	External doorstop
Bypass door	Door holder
Pocket door	Door closer
Wood folding door	Touch bars
	Cross bars
	Flush bolts
	Dustproof striker

continued

Door coordinator
Smoke gasket
Open back strike
Finish nails
Anchor bolts
6¼" drywall screws (including coarse thread)
Closer sleeves
Assortment of anchors, including:
 Wood stud anchor
 Steel stud anchor
 Sill anchors
 Masonry wall anchors
Shims
8d 2¼" casing nails
Wood spreader bar
Expansion shields
Machine bolts
Wire
Pencil
Masking tape
Cardboard shim strips
Paraffin wax
Soft bar soap
Hinges
High-frequency usage hinge
Door jambs
Weatherstripping
Thresholds
6' level

Magnetic level
Screwdriver set
Drill bit set
Masonry drill bit set
Electric drill
Telescoping braces
Measuring tape/ruler
Finishing sawhorses
Knife
Power saw
Hand saw
Fabricated door jack
Butt gauge
Soft-faced hammer
Wood chisel
Butt marker
Hinge butt template for doors and jambs
Door hanging system
Self-centering screw hole punch
Self-centering bit
Plane
Hole saw
Sledgehammer
Square
Door wedges
Router and operator's manual
Copies of the Quick Quizzes*
Module Examinations**
Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. If you require trainees to visit construction sites, ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to hang doors. Ensure that all trainees are properly briefed on safety procedures, tool safety, and lifting safety.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Finish Carpentry. Newton, CT: Taunton Press, 1997.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Doors and Door Hardware*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Door Types, Metal Doors	
A. Introduction	_____
B. Safety	_____
C. Door Types and Basic Construction	_____
D. Metal Doors	_____
E. Laboratory	_____
Trainees practice installing a metal door. This laboratory corresponds to Performance Task 1.	
Sessions III–V. Wood Doors and Installing Prehung Doors	
A. Interior Wood Door Jambs	_____
B. Interior Wood Door	_____
C. Laboratory	_____
Trainees practice cutting hinges in a wooden door. This laboratory corresponds to Performance Task 3.	
D. Door Stop Strips	_____
E. Job Site Prehanging a Door Prior to Installation	_____
F. Manufactured Prehung Door Unit Installation	_____
G. Laboratory	_____
Trainees practice installing a prehung door or door hanging system. This laboratory corresponds to Performance Task 2.	
Session VI. Locksets and Other Door Hardware	
A. Locksets	_____
B. Laboratory	_____
Trainees practice installing a lockset. This laboratory corresponds to Performance Task 4.	
C. External Door Stops, Holders, and Door Closers	_____
D. Laboratory	_____
Trainees practice installing door closers. This laboratory corresponds to Performance Task 4.	
E. Other Door Hardware	_____
Session VII. Other Door Types and Door Lights	
A. Other Door Types	_____
B. Laboratory	_____
Trainees practice installing a bifold door. This laboratory corresponds to Performance Task 5.	
C. Door Lights	_____
D. Commercial Exterior Doors	_____

Session VIII. Review and Testing

A. Module Review

B. Module Examination

1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module includes the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27208-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Establish a level line.
2. Explain the common terms related to sound waves and acoustical ceiling materials.
3. Identify the different types of suspended ceilings.
4. Interpret plans related to ceiling layout.
5. Sketch the ceiling layout for a basic suspended ceiling.
6. Perform a material takeoff for a suspended ceiling.
7. Install selected suspended ceilings.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Use a water level and/or establish a level line at ceiling level such as is required when installing the wall angle for a suspended ceiling.
2. Lay out and install selected suspended ceiling systems according to a specific plan.
 - Exposed grid ceiling system
 - Metal pan ceiling system
 - Direct-hung concealed grid system
 - Drywall furring ceiling system
3. Draw a ceiling plan/sketch for a typical room, then use the plan/sketch to estimate the quantities of materials needed to install an exposed grid ceiling system in the room.

MATERIALS AND EQUIPMENT LIST

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Carpentry Level Two PowerPoint® Presentation
Slides (ISBN 978-0-13-229138-5)
Multimedia projector and screen
Computer
Appropriate personal protective equipment
Pictures of various types of suspended ceilings
Decibel meter
Set of blueprints
Scrap pieces of wall angle
Exposed grid ceiling system components
Metal pan ceiling system components
Direct-hung concealed grid ceiling system components

Drywall furring ceiling system components
Graph paper
Examples of different types of ceiling panels and tiles
Basic carpenter's tool box
Framing square
Level
Driver/drill (electric and/or battery-operated) and assorted drill bits/driver bits
Ladders
Water level, builder's level, and/or laser with a wall/ceiling mount or tripod
Aviation snips
Clamping pliers or Vise-Grip™ pliers
Chalkline
50' or 100' tape

continued

Keyhole saw
 Lath nippers
 Magnetic punch
 Scribes or compass
 Tile knife
 Pop-rivet gun
 Powder-actuated fastening tool
 Scaffold
 Whitney punch
 Plumb bob

Architect's scale
 Awl
 6' folding rule
 Straightedge
 A board
 Hanger wire
 Copies of the Quick Quizzes*
 Module Examinations**
 Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFTY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. If you require trainees to visit construction sites, ensure that they are briefed on site safety procedures. This module requires trainees to install suspended ceilings. Ensure that they are properly briefed on the use of all tools and personal protection necessary.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

CISCA Ceiling Systems Handbook. St. Charles, IL: The Ceiling and Interior Systems Contractors' Association, 1999.

The Gypsum Construction Handbook. Chicago, IL: USG Corporation.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Suspended Ceilings*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction to Suspended Ceilings	
A. Introduction	_____
B. Sound Wave Propagation and Characteristics	_____
C. Acoustical Terms	_____
D. Reading Blueprints	_____
E. Ceiling Leveling Equipment	_____
F. Laboratory	_____
<p>Trainees practice using a level to establish a level line. This laboratory corresponds to Performance Task 1.</p>	

Session II. Ceiling Panels and Tiles I

- A. Ceiling Panels and Tiles
- B. Exposed Grid System
- C. Laboratory

Trainees practice laying out and installing selected ceiling systems. This laboratory corresponds to Performance Task 2.

Session III. Ceiling Panels and Tiles II

- A. Metal Pan Systems
- B. Laboratory

Trainees practice laying out and installing selected ceiling systems. This laboratory corresponds to Performance Task 2.

Session IV. Ceiling Panels and Tiles III

- A. Direct-hung Concealed Grid Systems
- B. Laboratory

Trainees practice laying out and installing selected ceiling systems. This laboratory corresponds to Performance Task 2.

Session V. Ceiling Panels and Tiles IV

- A. Integrated Ceiling Systems
- B. Luminous Ceiling Systems
- C. Suspended Drywall Furring Ceiling Systems
- D. Laboratory

Trainees practice laying out and installing selected ceiling systems. This laboratory corresponds to Performance Task 2.

- E. Special Ceiling Systems

Session VI. Layout, Cleaning, Installation; Review and Testing

- A. Laying Out and Estimating Materials
- B. Laboratory

Trainees practice estimating materials needed for a ceiling. This laboratory corresponds to Performance Task 3.

- C. Ceiling Cleaning
- D. Installation Guidelines
- E. Module Review
- F. Module Examination

1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

- G. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module covers the different types of trim used in finish work. It focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27209-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the different types of standard moldings and describe their uses.
2. Make square and miter cuts using a miter box or power miter saw.
3. Make coped joint cuts using a coping saw.
4. Select and properly use fasteners to install trim.
5. Install interior trim, including:
 - Door trim
 - Window trim
 - Base trim
 - Ceiling trim
6. Estimate the quantities of different trim materials required for selected rooms.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Make square and miter cuts to selected moldings using a metal/wooden miter box.
2. Make square and miter cuts to selected moldings using a power miter/compound miter saw.
3. Make a coped joint using a coping saw.
4. Use a pneumatic finish nailer to fasten molding.
5. Install interior trim, including:
 - Door trim
 - Window trim
 - Base trim
 - Ceiling trim
6. Estimate the quantities of different trim materials required for selected rooms.

MATERIALS AND EQUIPMENT LIST

Markers/chalk

Pencils and scratch paper

Whiteboard/chalkboard

Carpentry Level Two PowerPoint® Presentation
Slides (ISBN 978-0-13-229138-5)

Multimedia projector and screen

Computer

Appropriate personal protective equipment

Assortment of custom and mill trim, including:

 Prefinished moldings

 Base, base cap, and base shoe molding

 Casing and casing stop moldings

 Crown, bed, and cove moldings

 Quarter round, corner guard, chair rail, and
 wainscot cap moldings

 Rabbeted stools

 Pneumatically driven nails

 Assortment of fiberboard polystyrene, and other
 non-wood moldings

 Basic carpenter's tool box

 Coping saw

 Backsaw

 Carpenter's and dovetail trim saw

 Framing square

continued

Level
 Metal and wooden miter boxes and hacksaw
 Power and compound miter saws
 Pneumatic finish nailer

Driver/drill (electric and/or battery-operated)
 Copies of the Quick Quiz*
 Module Examinations**
 Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to cut and install trim. Ensure that they are properly briefed on the use of all tools and personal protection necessary.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Finish Carpentry. Newton, CT: Taunton Press, 1997.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Window, Door, Floor, and Ceiling Trim*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction to Window, Door, Floor, and Ceiling Trim	
A. Introduction	_____
B. Types of Moldings	_____
Session II. Basic Procedures and Guidelines	
A. Cutting Trim—Square and Miter Cuts	_____
B. Laboratory	_____
Trainees practice making square and miter cuts. This laboratory corresponds to Performance Tasks 1 and 2.	
C. Making a Coped Joint	_____
D. Laboratory	_____
Trainees practice making coped joints. This laboratory corresponds to Performance Task 3.	
E. Fastening Trim	_____
F. Laboratory	_____
Trainees practice using a pneumatic nailer to fasten trim. This laboratory corresponds to Performance Task 4.	

Sessions III and IV. Window and Door Trim

A. Window Trim Installation Techniques and Guidelines _____

B. Laboratory _____

Trainees practice installing window trim. This laboratory corresponds to Performance Task 5.

C. Door Trim Installation Techniques and Guidelines _____

D. Laboratory _____

Trainees practice installing door trim. This laboratory corresponds to Performance Task 5.

Sessions V and VI. Baseboard Trim

A. Baseboard Trim Installation Techniques and Guidelines _____

B. Laboratory _____

Trainees practice installing baseboard trim. This laboratory corresponds to Performance Task 5.

Sessions VII and VIII. Ceiling Trim

A. Ceiling Trim Installation Techniques and Guidelines _____

B. Laboratory _____

Trainees practice installing ceiling trim. This laboratory corresponds to Performance Task 5.

Session IX. Estimating Trim Materials

A. Estimating Materials _____

B. Laboratory _____

Trainees practice estimating trim materials needed for a room. This laboratory corresponds to Performance Task 6.

Session X. Review and Testing

A. Module Review _____

B. Module Examination _____

1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing _____

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27210-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. State the classes and sizes of typical base and wall kitchen cabinets.
2. Identify the cabinet components and hardware and describe their purposes.
3. Lay out factory-made cabinets, countertops, and backsplashes.
4. Explain the installation of an island base.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Lay out and identify various types of base and wall units following a specified layout scheme.
2. OPTIONAL—Install and assemble various types of factory-built base and wall units following a specified layout scheme.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	2 × 4 scrap material
Pencils and scratch paper	Countertop base and backsplash
Whiteboard/chalkboard	Sheets of plastic laminate
<i>Carpentry Level Two</i> PowerPoint® Presentation Slides (ISBN 978-0-13-229138-5)	Contact cement
Multimedia projector and screen	Dowels or similar objects used to prevent unintentional contact between laminate and countertop cemented surfaces
Computer	Examples of blueprints, design sketches, and/or shop drawings of cabinet arrangements
Literature on various types of kitchen cabinets	Basic carpenter's tool box
Examples of woods, plywood, particleboard, and other materials used in cabinet construction	Framing square
Examples of cabinet doors and drawers	Level
Examples of metal drawer guides	Block plate
Examples of cabinet door hinges	Circular saw and extension cord
Examples of cabinet door catches and knobs	Power/compound miter saw
Examples of plastic laminate and solid-surface materials used for countertops	Driver/drill (electric and/or battery-operated) and assorted drill bits/driver bits
Assortment of fasteners used for cabinet construction and installation	Assortment of clamps
Wall base cabinet units	Sawhorses
Shim shingles	J-rollers

continued

Rollers/brushes for applying contact cement
 Saber saw and blades
 Biscuit jointer
Carpentry Levels 3 & 4 Video Package. Video 2: Interior Carpentry: Ceilings/Cabinets (optional)

TV DVD/VCR player
 Copies of the Quick Quiz*
 Module Examinations**
 Performance Profile Sheets**

*Located at the back of this module.

**Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to cut and install cabinets and countertops. Ensure that they are properly briefed on the use of all tools and personal protection necessary.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Cabinet Makers Association website, www.cabinetmakers.org

Kitchen Cabinet Makers Association website, www.kcma.org

Mill's Pride Cabinetry website, www.millspride.com

Carpentry Levels 3 & 4 Video Package. Video 2: Interior Carpentry: Ceilings/Cabinets. NCCER. Upper Saddle River, NJ: Prentice Hall.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Cabinet Installation*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction to Cabinet Construction	
A. Introduction	_____
B. Parts of Manufactured Cabinets	_____
C. Woods and Materials Used in Cabinet Construction	_____
D. Cabinet Doors	_____
E. Cabinet Drawers	_____
F. Cabinet Door and Drawer Hardware	_____
G. Cabinet Shelves and Shelf Hardware	_____

Sessions II and III. Cabinet Installation

A. Cabinet Islands

B. Commercial Cabinets

C. Fasteners

D. Countertops

E. Installing Cabinets

F. Laboratory

Trainees practice laying out and identifying various types of base and wall units following a specified layout scheme. This laboratory corresponds to Performance Task 1.

G. Laboratory

Trainees practice installing and assembling various types of factory-built base and wall units. This laboratory corresponds to Performance Task 2.

Session IV. Review and Testing

A. Module Review

B. Module Examination

1. Trainees must score 70% or higher to receive recognition from NCCER.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module provides an introduction to the materials, tools, and methods used in cabinetmaking. Practice projects are included to help trainees learn the various joining techniques used by cabinetmakers, while providing practice on stationary power tools. Two complete projects used in past SkillsUSA national competitions are also provided.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Carpentry Fundamentals Level One*; and *Carpentry Framing and Finishing Level Two*, Modules 27201-07 through 27211-07.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Recognize the common types of woods used to make cabinets.
2. Correctly and safely use stationary power tools.
3. Identify and cut the various types of joints used in cabinetmaking.
4. Build a cabinet from a set of drawings.
5. Install plastic laminate on a countertop core.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Use stationary power tools to make joints commonly used by cabinetmakers.
2. Build a cabinet from a set of drawings.
3. Install plastic laminate on a countertop core.

MATERIALS AND EQUIPMENT LIST

Markers/chalk	Scrap lumber, including:
Pencils and scratch paper	1 × 4
Whiteboard/chalkboard	1 × 6
<i>Carpentry Level Two</i> PowerPoint® Presentation	2 × 4
Slides (ISBN 978-0-13-229138-5)	Scrap piece of ¼" lauan plywood
Multimedia projector and screen	Wood glue
Computer	Biscuits and dowels
Examples of woods, plywood, particleboard, and other materials used in cabinet construction	Carpenter's basic tool box
Examples of cabinet doors and drawers	Framing square
Shaper cutting heads	Level
Samples of cuts made with a shaper	Block plane
Assortment of cabinet door, drawer, and shelf hardware	Assortment of clamps
Examples of joints commonly used by cabinetmakers	Sawhorses
Examples of plastic laminate and solid-surface materials used for countertops	Router/laminate trimmer and assorted bits
Countertop base and backsplash	Samples of various cuts that can be made with a router
Contact cement	J-rollers
Dowels or similar objects for use to prevent unintentional contact between laminate and countertop cemented surfaces.	Saber saw and blades
	Belt sander and various abrasives
	Rollers/brushes for applying contact cement
	Biscuit jointer
	Brad gun
	Table saw

continued

Radial arm saw
 Several grades of sandpaper
 Semifinished pieces
 Compound miter saw
 Jointer-planer
 Router table
 Disc sander
 Thickness planer
 Samples of wood stock before and after using a thickness planer

Drill press
 Scroll saw or band saw
 Wood sealers
 Wood filler
Carpentry Levels 3 & 4 Video Package. Video 2: Interior Carpentry: Ceilings/Cabinets (optional)
 TV/DVD/VCR player
 Module Examinations*
 Performance Profile Sheets*

*Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Ensure that they are briefed on site safety procedures. This module requires trainees to use power tools to cut and build cabinets and countertops. Ensure that they are properly briefed on the use of all tools and personal protection necessary.

ADDITIONAL RESOURCES

This module presents thorough resources for task training. The following resource material is suggested for further study.

Cabinet Makers Association website, www.cabinetmakers.org

Kitchen Cabinet Makers Association website, www.kcma.org

Mill's Pride Cabinetry website, www.millspride.com

Carpentry Levels 3 & 4 Video Package. Video 2: Interior Carpentry: Ceilings/Cabinets. NCCER. Upper Saddle River, NJ: Prentice Hall.

Hand and Power Tools, OSHA 3080, 2002. U.S. Department of Labor. Washington, DC: U.S. Government Printing Office.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Cabinet Fabrication*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Woods, Tools, and Joints	
A. Introduction	_____
B. Woods and Materials Used in Cabinet Construction	_____
C. Shop Tools Used in Cabinetmaking	_____
D. Joints	_____
E. Laboratory	_____
Trainees practice using stationary power tools to make joints commonly used by cabinetmakers. This laboratory corresponds to Performance Task 1.	

Sessions II and III. Cabinet Construction

- A. Assembling the Cabinet
- B. Sanding and Finishing
- C. Laboratory

Trainees practice building a cabinet from a set of drawings. This laboratory corresponds to Performance Task 2.

Session IV. Countertops, Mass-Production, Review, and Testing

- A. Plastic Laminate
- B. Laboratory
- C. Installing Solid-Surface Countertops
- D. Mass-Production Cabinetmaking
- E. Module Review
- F. Module Examination

- 1. Trainees must score 70% or higher to receive recognition from NCCER.
- 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.

G. Performance Testing

- 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
- 2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.
