

## **MODULE OVERVIEW**

This module provides information that will help trainees read and understand commercial drawings and specifications. It includes an explanation of how drawings are used to convey specific construction requirements.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Drywall Level One*.

## **OBJECTIVES**

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

1. Recognize the differences between commercial and residential construction drawings.
2. Identify the sheet index, material symbols, code summary, project team, 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.

## **PERFORMANCE TASKS**

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

1. Locate ten items contained in a set of commercial drawings (the instructor will select the items).
2. Using a door and window schedule, identify the hardware, ratings, and finishing for each door and window.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Appropriate personal protective equipment

Pictures of commercial buildings

Set of commercial drawings

Set of residential drawings

Window and door schedules and related floor plans

Written specifications

Examples of the following plans/drawings:

Site plans

Structural drawings

Mechanical drawings

Plumbing drawings

Electrical drawings

Architectural drawings

Floor plans

Detail drawings

Elevation drawings

Framing plans

Copies of Quick Quizzes\*

Module Examination\*\*

Performance Profile Sheets\*\*

\* Located in the back of this module.

\*\* Located in the Test Booklet.

## SAFETY CONSIDERATIONS

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

## ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

*Architectural Graphic Standards*, Eighth Edition, The American Institute of Architects, John Wiley & Sons, New York, NY, 1988.

*Basics for Builders: Plan Reading & Material Takeoff*, Wayne J. DelPico, R.S. Means Company, Inc., Kingston, MA, 1994.

## 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 |
|--|--------------|
| <b>Sessions I and II. Introduction; Commercial Plan Requirements and Contents</b>  |              |
| A. Introduction  | _____        |
| B. Commercial Plan Requirements and Contents   | _____        |
| 1. Requirements  | _____        |
| 2. Contents  | _____        |
| <b>Sessions III and IV. Reading and Understanding Drawings I</b>   |              |
| A. Reading Commercial Plans  | _____        |
| B. Architectural Drawings  | _____        |
| C. Laboratory  | _____        |
| Have trainees practice calculating the area of each room in a floor plan in a set of commercial drawings.  |              |
| <b>Sessions V and VI. Reading and Understanding Drawings II</b>  |              |
| A. Schedules   | _____        |
| B. Elevations and Sections   | _____        |
| C. Laboratory  | _____        |
| Have trainees use a door and window schedule to identify the hardware, ratings, and finishing for each door and window. This laboratory corresponds to Performance Task 2. |              |
| <b>Sessions VII and VIII. Reading and Understanding Drawings III</b>   |              |
| A. Structural Drawings   | _____        |
| B. Mechanical Drawings   | _____        |

**Session IX. Reading and Understanding Drawings IV; Written Specifications**

- A. Electrical Drawings
- B. Written Specifications
- C. Laboratory

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Have trainees locate ten items contained in a set of commercial drawings. This laboratory corresponds to Performance Task 1.

**Session X. Review and Testing**

- A. Review
- B. 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.
- C. Performance Testing

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- 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.



**Annotated Instructor's Guide****MODULE OVERVIEW**

This module covers the various aspects of steel framing construction, including common tools and fasteners used, framing components, and framing system accessories. Instructions for selecting and installing steel framing for exterior walls, interior walls, and partitions are also provided.

**PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Drywall Level One*; and *Drywall Level Two*, Module 45201-09.

**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. 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 nonstructural wall with openings to include bracing and blocking.
7. Interpret engineer drawings/shop installations.
8. Follow shop drawings to build:
  - Windows/openings
  - Bottom track
  - Top track
  - Bypass clips
  - Deflection cups
9. Integrate work of other trades:
  - Window
  - Water management
  - Stone/brick
  - Miscellaneous iron support

**PERFORMANCE TASKS**

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

1. Build a section of curtain wall from shop drawings to include a window opening with headers, jambs, and sill.
2. Build a section of wall to include an attachment to miscellaneous iron; box out at vertical angles; install clips.
3. Build headers (back-to-back, box, and L-header).
4. Lay out and install a steel stud structural wall with openings to include bracing and blocking.
5. Lay out and install a steel stud nonstructural wall with openings to include bracing and blocking.

## MATERIALS AND EQUIPMENT LIST

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Hand tools required for steel framing::  
Screwgun  
Powder-actuated fastener gun  
Hammer drill  
Locking pliers (Vise-Grip™ pliers)  
C-clamps and bar clamps  
Chop saw  
Dry-cut metal cutting saw  
Swivel-head shears  
Aviation snips  
Hole punches  
Hole saw  
Laser level  
Laser bob  
Plumb bob  
Clinching tool  
End circuit nippers and metal snips  
Channel stud sheer  
Metal lock fastener (crimper)  
Hand level  
Claw hammer  
Framing square  
Powder-actuated tool training and certification materials  
*Standard for Cold-Formed Steel – General Provisions*  
Various fasteners used with steel framing:  
Self-tapping screws  
Drywall screws  
Pan head screws – 3/8", 1/2" Type S or S-12  
1/2" masonry nails  
Pins  
Bolts and anchors  
Floor plan  
Slip connectors  
Chalkline  
100' steel tape

\* Located in the back of this module.

\*\*Located in the Test Booklet.

Custom jigs  
Door frame jack  
Two 1" × 25-gauge metal straps  
Red or yellow spray paint  
Thin boards  
Wood wedges and blocks  
Samples of steel framing components and materials:  
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  
Plain drywall channel  
Metal joists  
Metal trusses  
Marked steel framing members (various)  
Bracing  
Nonstructural steel framing members and accessories  
To the extent possible, prebuilt samples to demonstrate techniques, including:  
Curtain wall framing  
Double top plate  
Held-back partition  
Furring channels  
Metal stud secured to a steel beam  
Metal stud attached to a metal channel  
Window frame and header  
Simple 90-degree radius wall  
Combination wood/metal frame window  
Metal stud wall secured to a concrete wall  
Metal stud frame for a glass wall  
Copies of the Quick Quiz\*  
Module Examinations\*\*  
Performance Profile Sheets\*\*

## 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 power tools and are appropriately trained and certified in the safe use of powder-activated tools before using them.

## ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Allied Steel Buildings: [www.alliedbuildings.com](http://www.alliedbuildings.com)

Dietrich Metal Framing, Inc.: [www.dietrichindustries.com](http://www.dietrichindustries.com)

Steel Framing Alliance: [www.steel framing.org](http://www.steel framing.org)

The Steel Network, Inc.: [www.steelnetwork.com](http://www.steelnetwork.com)

## 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 50 hours are suggested to cover *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 |
|---|--------------|
| <b>Sessions I–IV. Introduction; Tools, Fasteners, and Materials for Steel Framing</b> |              |
| A. Introduction   | _____        |
| 1. Structural Engineering   | _____        |
| B. Tools for Steel Framing Work   | _____        |
| 1. Power Tools  | _____        |
| 2. Cutting Tools  | _____        |
| 3. Laser Devices  | _____        |
| C. Fasteners for Steel Framing Work   | _____        |
| 1. Screws   | _____        |
| 2. Pins, Clinching, Bolts, and Anchors  | _____        |
| D. Steel Framing Materials and Methods  | _____        |
| 1. Identification Codes   | _____        |
| 2. Framing Methods  | _____        |
| E. Assembling a Steel Frame   | _____        |
| <b>Sessions V–VIII. Steel Framing Applications I</b>                                  |              |
| A. Framing Walls  | _____        |
| 1. Layout   | _____        |
| 2. Wall Assembly  | _____        |
| 3. Wall Installation  | _____        |
| 4. Header Assembly  | _____        |
| 5. Jambs and Sills  | _____        |

B. Laboratory

Have the trainees build a section of wall to include an attachment to miscellaneous iron; box out at vertical angles; install clips. This laboratory corresponds to Performance Task 2.

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C. Floor and Roof Assemblies

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**Sessions IX–XIII. Steel Framing Applications II**

A. Laboratory

Have the trainees build several types of headers (back-to-back, box, and L-shaped). This laboratory corresponds to Performance Task 3.

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B. Bracing Steel Walls

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C. Laboratory

Have the trainees lay out and install a steel stud structural wall with openings to include bracing and blocking. This laboratory corresponds to Performance Task 4.

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**Sessions XIV–XVIII. Steel Framing Applications III**

A. Nonstructural Wall Framing

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- 1. Curtain Walls
- 2. Curved Walls
- 3. Other Nonstructural Assemblies
- 4. Furring

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B. Laboratory

Have the trainees build a section of curtain wall from shop drawings to include window openings with headers, jambs, and sill. This laboratory corresponds to Performance Task 1.

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C. Laboratory

Have the trainees lay out and install a steel stud nonstructural wall with openings to include bracing and blocking. This laboratory corresponds to Performance Task 5.

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**Session XIX. Slip Connections and Other Connections**

A. Slip Connections

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B. Other Typical Connections

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**Session XX. Review and Testing**

A. Module Review

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B. 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.

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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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

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## **MODULE OVERVIEW**

This module covers the materials, layout, and installation procedures used in many types of commercial suspended ceiling systems. Information about specialty ceiling systems, seismic considerations, and suspended ceiling system materials estimation is also provided.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Drywall Level One; and Drywall Level Two*, Modules 45201-09 and 45202-09.

## **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 laser to 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.
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**

|   |  |
|---|--|
| Overhead projector and screen                                       | Variety of ceiling panels and tiles                                    |
| Transparencies  | Acoustical tile  |
| Blank acetate sheets  | Components for the following systems:                                  |
| Transparency pens   | Exposed grid ceiling system  |
| Whiteboard/chalkboard   | Suspended drywall furring system                                       |
| Markers/chalk   | Metal pan ceiling system   |
| Pencils and scratch paper   | Direct-hung concealed grid ceiling system                              |
| Appropriate personal protective equipment                           | Integrated ceiling system  |
| Pictures of various types of suspended ceilings                     | Ceiling components used in buildings in seismic categories D, E, and F |
| Pictures of drywall grid systems                                    | Materials/equipment for cleaning a suspended ceiling                   |
| Pictures of various luminous ceiling systems                        | Scrap pieces of wall angle   |
| Set of plans and specifications, including a reflected ceiling plan | Flat anti-breather spline  |
| Ceiling plan or scaled sketch of a ceiling layout                   | Decibel meter  |
| Graph paper   | Basic carpenter's tool box   |
| Architect's scale   | Framing square   |
|   | Level  |

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**Session II. Reading Plans and Specifications; Ceiling Leveling Equipment; Ceiling Panels and Tiles**

- A. Reading Plans and Specifications \_\_\_\_\_
- B. Ceiling Leveling Equipment \_\_\_\_\_
- C. Laboratory \_\_\_\_\_

Have trainees use a laser to establish a level line at ceiling level such as is required when installing the wall angle for a suspended ceiling. This laboratory corresponds to Performance Task 1.

- D. Ceiling Panels and Tiles \_\_\_\_\_

**Session III. Exposed Grid Systems**

- A. Grid System Components \_\_\_\_\_
- B. Installation Procedures \_\_\_\_\_

**Session IV. Suspended Drywall Ceiling Systems**

- A. Drywall Furring Ceiling Systems \_\_\_\_\_
- B. Drywall Grid Systems \_\_\_\_\_
- C. Laboratory \_\_\_\_\_

Have trainees lay out and install a selected suspended ceiling system according to a specific plan. This laboratory corresponds to Performance Task 2.

**Session V. Specialty Systems I**

- A. Metal Pan Systems \_\_\_\_\_
- B. Direct-Hung Concealed Grid Systems \_\_\_\_\_
- C. Integrated Ceiling Systems \_\_\_\_\_

**Session VI. Specialty Systems II; Seismic Considerations**

- A. Luminous Ceiling Systems \_\_\_\_\_
- B. Other Specialty Ceiling Systems \_\_\_\_\_
- C. Seismic Considerations \_\_\_\_\_

**Session VII. Laying Out and Estimating Materials; Cleaning Ceilings; Installation Best Practices**

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

Have trainees draw a ceiling plan/sketch for a room, and then use it to estimate the quantities of materials needed to install an exposed grid ceiling system in a room. This laboratory corresponds to Performance Task 3.

- C. Ceiling Cleaning \_\_\_\_\_
- D. Installation Best Practices \_\_\_\_\_

**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 Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

**Session II. Reading Plans and Specifications; Ceiling Leveling Equipment; Ceiling Panels and Tiles**

- A. Reading Plans and Specifications \_\_\_\_\_
- B. Ceiling Leveling Equipment \_\_\_\_\_
- C. Laboratory \_\_\_\_\_

Have trainees use a laser to establish a level line at ceiling level such as is required when installing the wall angle for a suspended ceiling. This laboratory corresponds to Performance Task 1.

- D. Ceiling Panels and Tiles \_\_\_\_\_

**Session III. Exposed Grid Systems**

- A. Grid System Components \_\_\_\_\_
- B. Installation Procedures \_\_\_\_\_

**Session IV. Suspended Drywall Ceiling Systems**

- A. Drywall Furring Ceiling Systems \_\_\_\_\_
- B. Drywall Grid Systems \_\_\_\_\_
- C. Laboratory \_\_\_\_\_

Have trainees lay out and install a selected suspended ceiling system according to a specific plan. This laboratory corresponds to Performance Task 2.

**Session V. Specialty Systems I**

- A. Metal Pan Systems \_\_\_\_\_
- B. Direct-Hung Concealed Grid Systems \_\_\_\_\_
- C. Integrated Ceiling Systems \_\_\_\_\_

**Session VI. Specialty Systems II; Seismic Considerations**

- A. Luminous Ceiling Systems \_\_\_\_\_
- B. Other Specialty Ceiling Systems \_\_\_\_\_
- C. Seismic Considerations \_\_\_\_\_

**Session VII. Laying Out and Estimating Materials; Cleaning Ceilings; Installation Best Practices**

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

Have trainees draw a ceiling plan/sketch for a room, and then use it to estimate the quantities of materials needed to install an exposed grid ceiling system in a room. This laboratory corresponds to Performance Task 3.

- C. Ceiling Cleaning \_\_\_\_\_
- D. Installation Best Practices \_\_\_\_\_

**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 Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



## **MODULE OVERVIEW**

This module provides information about interior finish products, including some of the most widely used wall and ceiling systems. General installation procedures are covered, as are several unique finish products.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Drywall Level One; and Drywall Level Two*, Modules 45201-09 through 45203-09.

## **OBJECTIVES**

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

1. Describe the composition and use of common types of specialty interior products.
2. Identify the different installation and attachment methods used with specialty interior products.

## **PERFORMANCE TASKS**

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

1. Identify various types of trim, and state their applications.
2. Measure, cut, and install trim.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen  
Transparencies  
Blank acetate sheets  
Transparency pens  
Whiteboard/chalkboard  
Markers/chalk  
Pencils and scratch paper  
Appropriate personal protective equipment  
Adhesives  
Impaling clips  
Zee-clips  
Wall bar/wall clips  
VELCRO® fasteners  
Nails and screws  
Battens  
Fabric-covered fiberglass panels  
Fabric wall or ceiling samples  
Examples of GFRG products  
Pieces of wood veneer  
Wood slats  
Trim of various types, including reveal trim  
Samples of wood wall and ceiling systems

Components, fasteners, and tools required for installing a ceiling trim system, to include:

Reflected ceiling plan or manufacturer's shop drawings  
Binder clips  
Installed ceiling grid  
Splice connectors  
Square  
25' tape  
Aviation snips  
Utility knife  
Hammer  
Screwdrivers  
Wire hangers and/or straps  
Laser level  
Chalkline

Tectum™ products  
Linear ceiling components  
Dome components  
Scrap pieces of metal column covers  
Copies of the Quick Quiz\*  
Module Examinations\*\*  
Performance Profile Sheets\*\*

\* Located in the back of this module.

\*\* Located in the Test Booklet.

## SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module will require trainees to measure, cut, and install trim.

## ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference work is suggested for both instructors and motivated trainees interested in further study. This is optional material for continued education rather than for task training.

*Drywall: Professional Techniques for Great Results*, 2002. Myron R. Ferguson. Newton, CT: Taunton Press.

## 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 *Interior Specialties*. 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 |
|---|--------------|
| <b>Session I. Introduction; Vinyl- and Fabric-Covered Fiberglass Panels; Fabric Walls and Ceilings</b>                            |              |
| A. Introduction   | _____        |
| B. Vinyl- and Fabric-Covered Fiberglass Panels  | _____        |
| C. Fabric Walls and Ceilings  | _____        |
| <b>Session II. Glass Fiber Reinforced Gypsum; Wood Wall and Ceiling Systems</b>   |              |
| A. Glass Fiber Reinforced Gypsum  | _____        |
| B. Wood Wall and Ceiling Systems  | _____        |
| <b>Session III. Ceiling Trim Systems I</b>  |              |
| A. Trim Types and Applications  | _____        |
| B. Laboratory   | _____        |
| Have trainees identify various types of trim, and state their applications.<br>This laboratory corresponds to Performance Task 1. |              |
| <b>Session IV. Ceiling Trim Systems II</b>  |              |
| A. Installation Guidelines  | _____        |
| B. Installation of a Ceiling Trim System  | _____        |
| C. Laboratory   | _____        |
| Trainees measure, cut, and install trim. This laboratory corresponds to<br>Performance Task 2.                                    |              |
| <b>Session V. Tectum™ Panels; Other Finish Systems; Safety</b>  |              |
| A. Tectum™ Panels   | _____        |
| B. Other Finish Systems   | _____        |
| C. Safety   | _____        |

**Session VI. Review and Testing**

A. Module Review

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B. Module Examination

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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.

C. Performance Testing

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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.





**Annotated Instructor's Guide****MODULE OVERVIEW**

This module covers the main functions of exterior cladding and the different types of cladding available. Procedures for exterior cladding installation are also provided.

**PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Drywall Level One; and Drywall Level Two*, Modules 45201-09 through 45204-09.

**OBJECTIVES**

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

1. Distinguish between extruded and expanded foam insulations.
2. Identify trims used in exterior insulation and finish systems (EIFS) and stucco, and state their uses.
3. Distinguish between traditional and water management EIFS.
4. Distinguish between traditional hard-coat plaster and synthetic finishes.
5. Describe how to install synthetic veneer stone.
6. Describe building features commonly created with glass fiber reinforced concrete (GFRC).

**PERFORMANCE TASKS**

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

1. Install starter track and stick foam to appropriate substrate.
2. Rasp foam; mix base coat; and install mesh and base coat on the foam panel completed in Task 1.
3. Prime and install finish on panel completed in Task 2.

**MATERIALS AND EQUIPMENT LIST**

|   |  |
|---|--|
| Overhead projector and screen             | Example of a rabbet, or stucco lock                          |
| Transparencies                            | Synthetic and real stones                                    |
| Blank acetate sheets                      | Adhesives, hardware, and grout for fastening synthetic stone |
| Transparency pens                         | Expanded polystyrene (EPS) samples                           |
| Whiteboard/chalkboard                     | Extruded polystyrene (XPS) samples                           |
| Markers/chalk                             | Example of a section of a multilayer EIFS                    |
| Pencils and scratch paper                 | Components for installing a multilayer EIFS:                 |
| Appropriate personal protective equipment | Starter track  |
| Building paper                            | Substrate  |
| Various house wraps                       | Foam   |
| Nails and screws                          | Base coat  |
| Control joints                            | Mesh   |
| Weep screeds                              | Primer   |
| Starter strips                            | Finish   |
| Flashing                                  | Backwrapping   |
| Samples of traditional and acrylic stucco | Flashing   |
| Example of a section of stucco layers     | Sealant  |

*continued*

Rasp  
 Hawk  
 Notched metal and plastic trowels  
 Roller or paint brush  
 25' tape  
 Utility knife  
 Square  
 Screwdrivers

Hammer  
 Electric and/or pneumatic power shears  
 Examples of fiber-cement siding  
 Examples of GFRG products  
 Copies of the Quick Quiz\*  
 Module Examinations\*\*  
 Performance Profile Sheets\*\*

\* Located in the back of this module.

\*\* Located in the Test Booklet.

## SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module will require trainees to perform selected EIFS installation procedures. In addition, trainees may be required to tour a site where synthetic stone is being installed. Ensure that they are briefed on site safety procedures.

## ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following references are suggested for both instructors and motivated trainees interested in further study. These are optional resources for continued education rather than for task training.

<http://www.cement.org>

<http://www.culturedstone.com> (1-800-255-1727)

<http://www.eima.com>

<http://www.eldoradostone.com>

<http://www.jameshardiecommercial.com>

## 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 *Exterior Cladding*. 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.

| <b>Topic</b>                                     | <b>Planned Time</b> |
|--|---------------------|
| <b>Session I. Introduction; Air Infiltration</b> |                     |
| A. Introduction                                  | _____               |
| B. Air Infiltration                              | _____               |
| <b>Session II. Trim; Cladding; Stucco</b>        |                     |
| A. Trim  | _____               |
| B. Cladding                                      | _____               |
| C. Stucco  | _____               |
| <b>Session III. Synthetic Stone</b>              |                     |
| A. Synthetic Stone                               | _____               |

**Sessions IV-VI. Exterior Insulation and Finish Systems (EIFS)**

A. Exterior Insulation and Finish Systems (EIFS) \_\_\_\_\_

B. Laboratory \_\_\_\_\_

Have trainees install a starter track and stick foam to an appropriate substrate. This laboratory corresponds to Performance Task 1.

C. Laboratory \_\_\_\_\_

Have trainees rasp foam, mix base coat, and install mesh and base coat on the foam panel completed in Task 1. This laboratory corresponds to Performance Task 2.

D. Laboratory \_\_\_\_\_

Have trainees prime and install finish on the panel completed in Task 2. This laboratory corresponds to Performance Task 3.

**Session VII. Panelized Cladding; Glass Fiber Reinforced Concrete (GFRC)**

A. Panelized Cladding \_\_\_\_\_

B. Glass Fiber Reinforced Concrete (GFRC) \_\_\_\_\_

**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 Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



**Annotated Instructor's Guide****MODULE OVERVIEW**

This module provides information about paints, painting, and texturing, as well as application techniques that can give interiors a rich, warm appearance.

**PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Drywall Level One; and Drywall Level Two*, Modules 45201-09 through 45205-09.

**OBJECTIVES**

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

1. Identify various material types for interior finishes and state their applications.
2. Identify and select the appropriate tools used to apply specific interior finishes.
3. Identify various finish and texture samples.

**PERFORMANCE TASKS**

This is a knowledge-based module; there are no performance tasks.

**MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Appropriate personal protective equipment

Examples of surfaces painted with textured paint

Texturing materials added to paint, such as:

Sand

Vermiculite

Polystyrene

Paint and compound mixers

Paint sprayers

Spray texturing machines

Hand tools for painting:

Stipple brush

Tandem texture brush

Foam texture roller

Oil-based and water-based primers

Examples of the following spray-on textures:

Popcorn

Orange peel

Knock-down

Examples of powder and ready-mixed texturing compounds

Examples of textured finishes that can be achieved with texturing compound:

Bold shadowing

Medium stipple

Light stipple

Swirl finish

Crow's foot

Examples of faux finishes

Supplies needed to create a marble faux finish:

Several shades of latex paint

Clear polyurethane varnish or wax

Paint roller/holder and pan

Natural sea sponge

Pointed artist's brush

Examples of Venetian plaster faux finish

Supplies needed to create a Venetian plaster faux finish:

Venetian plaster or Venetian plaster paint

Venetian plaster or paint top coat

Steel trowel or blade with rounded corners

Clean cloth, power buffer, or power sander with 600-grit sandpaper

Module Examinations\*

\*Located in the Test Booklet.

## ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

*Drywall: Professional Techniques for Great Results*, 2002. Myron R. Ferguson. Newton, CT: Taunton Press.

*Installing and Finishing Drywall*, 1998. William Spence. New York, NY: Sterling Publishing Company.

## 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 *Specialty Finishes*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

| Topic  | Planned Time |
|--|--------------|
| <b>Session I. Introduction; Paints</b>   |              |
| A. Introduction  | _____        |
| B. Paints  | _____        |
| <b>Session II. Tools</b>   |              |
| A. Paint and Compound Mixers   | _____        |
| B. Paint Sprayers  | _____        |
| C. Spray Texturing Machines  | _____        |
| D. Hand Tools  | _____        |
| <b>Session III. Finish Coat Application</b>  |              |
| A. Surface Preparation   | _____        |
| B. Primer  | _____        |
| C. Spray Painting  | _____        |
| <b>Session IV. Specialty Finishes I</b>  |              |
| A. Texturing Compound  | _____        |
| B. Textured Paints   | _____        |
| <b>Session V. Specialty Finishes II; Safety</b>  |              |
| A. Faux Finishes   | _____        |
| B. Safety  | _____        |
| <b>Session VI. Review and Testing</b>  |              |
| A. Module Review   | _____        |
| B. 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. |              |