Exhaust systems are primarily used to move air from inside a structure to the environment outside. There are many reasons to exhaust air from a building, with the removal of airborne fumes and contaminants being a common goal. Several categories of filtration and exhaust systems are introduced here. Each type is effective or preferred in one or more applications. Sheet metal craftworkers should be familiar with the equipment and duct systems used in exhaust and ventilation applications. Depending on the application, the duct fabrication and installation requirements can be significantly different from those related to conditioned-air distribution.

**Learning Objective 1**

Successful completion of this module prepares trainees to:

- Identify hazards addressed through ventilation and describe the ventilation requirements for various industrial processes.
  
  a. Identify various particulate and respiratory hazards.
  b. Describe basic approaches to ventilation design.
  c. Identify and describe common exhaust hood designs.
  d. Describe ventilation requirements for spray painting operations.
  e. Describe ventilation requirements for welding, cutting, and brazing.

**Learning Objective 2**

Successful completion of this module prepares trainees to:

- Identify and describe various types of filtration and debris-collection equipment.
  
  a. Identify and describe grease filters.
  b. Identify and describe electrostatic precipitators.
  c. Identify and describe fabric collectors.
  d. Identify and describe wet and dry centrifugal collectors.
Learning Objective 3

Successful completion of this module prepares trainees to:
Identify appropriate exhaust duct materials and describe the joints and fittings used in exhaust ducts.

a. Identify appropriate exhaust duct materials for various applications.
b. Identify and describe joints and fittings used in exhaust ducts.

Performance Tasks

This is a knowledge-based module; no Performance Tasks are required for module completion.

Recommended Teaching Time: 25 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 04404
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
Welding and Brazing

Sheet Metal

Overview

Welding and brazing are important skills for sheet metal workers to learn. They are tasks that require special training, practice, and a keen awareness of the hazards involved. As a sheet metal trainee, it is important to learn how to safely and properly operate the equipment used for welding and brazing as well as how to produce quality results. Although it is unlikely that these tasks will be performed continuously without a great deal of additional training and practice, they are skills that are essential when the need arises.

Learning Objective 1

Successful completion of this module prepares trainees to:
State welding safety precautions and describe basic arc-welding equipment.

a. State welding safety precautions.
b. Identify the required PPE for welding and cutting processes.
c. Identify and describe basic arc-welding machines and accessories.
d. Identify and describe common arc-welding electrodes.

Learning Objective 2

Successful completion of this module prepares trainees to:
Describe shielded metal-arc welding and how common welds are made.

a. Explain how to start and terminate a weld.
b. Explain how make stringer beads on a flat surface.
c. Explain how to use weaving and padding techniques.
d. Identify various welded joints and explain how they are accomplished.

Learning Objective 3

Successful completion of this module prepares trainees to:
Describe other common welding processes.

   a. Describe the gas tungsten-arc welding process.
   b. Describe the gas metal-arc welding process.

**Learning Objective 4**

*Successful completion of this module prepares trainees to:

Describe how to operate an oxyacetylene torch and braze metals.

   a. State safety precautions relevant to brazing.
   b. Explain how to prepare and braze copper tubing.

**Performance Tasks**

1. Set up and adjust an arc-welding machine.
2. Create SMAW stringer beads on steel plate.

Recommended Teaching Time: 25 hours

**Classroom Equipment and Materials**

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 04403
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations

**Performance Tasks 1 and 2**

- Appropriate PPE for both welding and coupon preparation
- Steel coupons for welding practice; $\frac{3}{16}" - \frac{3}{4}"$ plate preferred
- E6010 or E6011 electrodes
• Grinders
• Wire brushes
• Chipping hammers
• DCEP-capable welding machines (see Figure 31)
• Necessary accessories, including electrode holders, ground clamps, and cables
• Welding booths or other appropriate and properly ventilated areas for welding
• Buckets of water to quench coupons
• Fire extinguishers
• Performance Profile Sheets
Module Two (29102-15) introduces the trainees to the methods and procedures of the oxyfuel cutting process. Trainees will learn safety procedures, equipment setup, fuel gas types, flow rates, and techniques. Hands-on practice and the completion of cutting-related Performance Tasks complete the learning process.

### Objectives

**Learning Objective 1**
- Describe oxyfuel cutting and identify related safe work practices.
  - a. Describe basic oxyfuel cutting.
  - b. Identify safe work practices related to oxyfuel cutting.

**Learning Objective 2**
- Identify and describe oxyfuel cutting equipment and consumables.
  - a. Identify and describe various gases and cylinders used for oxyfuel cutting.
  - b. Identify and describe hoses and various types of regulators.
  - c. Identify and describe cutting torches and tips.
  - d. Identify and describe other miscellaneous oxyfuel cutting accessories.
  - e. Identify and describe specialized cutting equipment.

**Learning Objective 3**
- Explain how to setup, light, and shut down oxyfuel equipment.
  - a. Explain how to properly prepare a torch set for operation.
  - b. Explain how to leak test oxyfuel equipment.
  - c. Explain how to light the torch and adjust for the proper flame.
  - d. Explain how to properly shut down oxyfuel cutting equipment.

**Learning Objective 4**
- Explain how to perform various oxyfuel cutting procedures.
  - a. Identify the appearance of both good and inferior cuts and their causes.
  - b. Explain how to cut both thick and thin steel.

**Learning Objective 4 (continued)**
- c. Explain how to bevel, wash, and gouge.
- d. Explain how to make straight and bevel cuts with portable oxyfuel cutting machines.

### Performance Tasks

**Performance Task 1 (Learning Objective 3)**
- Set up oxyfuel cutting equipment.

**Performance Task 2 (Learning Objective 3)**
- Light and adjust an oxyfuel torch.

**Performance Task 3 (Learning Objective 3)**
- Shut down oxyfuel cutting equipment.

**Performance Task 4 (Learning Objective 3)**
- Disassemble oxyfuel cutting equipment.

**Performance Task 5 (Learning Objective 3)**
- Change empty gas cylinders.

**Performance Task 6 (Learning Objective 4)**
- Cut shapes from various thicknesses of steel, emphasizing:
  - Straight line cutting
  - Square shape cutting
  - Piercing
  - Beveling
  - Cutting slot

**Performance Task 7 (Learning Objective 4)**
- Perform washing.

**Performance Task 8 (Learning Objective 4)**
- Perform gouging.

**Performance Task 9 (Learning Objective 4)**
- Use a track burner to cut straight lines and bevels.

### Teaching Time: 17.5 hours
(Seven 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites

*Core Curriculum; Welding Level One, Module 29101-15.*
Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider the time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the written examinations and performance profile sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70% or above for the written examination; performance testing is graded pass or fail.

Safety Considerations
This module requires that trainees work with a cutting torch, oxygen, and fuel gases, and very hot materials. Safety must be emphasized at all times. Trainees should be carefully observed to ensure that they wear the proper PPE, follow safe practices, and give due respect to hazards related to oxyfuel cutting equipment. Ensure all trainees use the proper lens tints to avoid eye damage and use the proper type of gloves. Any deficiencies must be corrected to ensure future trainee safety. All practice sessions and performance tasks must be completed under the instructor’s direct supervision.

Classroom Equipment and Materials
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
Welding Level One PowerPoint® Presentation
DVD player or a computer with a DVD drive
LCD projector and screen
Computer with Internet access
Selection of usable and non-usable hoses
Pressure regulators
Assorted thin steel pieces cut and exhibiting distortion
Module Review Question and Trade Terms Quiz answer keys
Copies of the Module Examination and Performance Profile Sheets

Equipment and Materials for Laboratories and Performance Testing
Appropriate PPE:
Appropriate flame-retardant clothing
Safety glasses
Welding gloves
Appropriate goggles or face shield
Proper footwear as designated by the instructor or training facility provider
Hearing protection as designated by the instructor or training facility provider
Oxygen cylinder
Fuel gas cylinder
Pressure regulators (oxygen and fuel gas)
Hose set
Cutting torches, combination or one-piece
Assorted torch tips (cutting, washing, and gouging)
Cylinder cart
Files
Squares
Tape measure or steel rule
Soapstone
Common hand tools
Chipping hammers
Friction lighters
Tip cleaners, drills, and files
Approved leak testing solution
Torch wrenches
Sufficient carbon steel plate (≥¼” or 6 mm thick)
Sufficient carbon steel plate (<½” or 6 mm thick)
Portable oxyfuel track burner

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


There are a number of online resources available for trainees who would like more information on oxyfuel cutting. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. There are a number of accessible videos related to oxyfuel cutting on the Internet. For example, The Harris Products Group, a division of Lincoln Electric, offers well-produced videos related to oxyfuel cutting. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.
The Lesson Plan for this module is divided into seven 2.5-hour sessions. This time includes 10 minutes for administrative tasks and a 10-minute break per session.

**SESSION ONE**

Session One explains the oxyfuel cutting processes and identifies related safety precautions. Trainees will also be introduced to cylinder handling and storage. This session covers Sections 1.0.0 through 2.3.3.

1. Show the Session One PowerPoint® presentation.
2. Use the Kickoff Activity to get trainees engaged and give them an idea of what they will learn from this module.
3. Describe basic oxyfuel or flame cutting processes.
4. Identify safe work practices, including PPE, fire/explosion prevention, and work area ventilation.
5. Identify precautions associated with cylinder handling and storage.
6. Describe how to identify oxyfuel cutting equipment and consumables.
7. Describe how to identify cutting torches and tips.

**SESSION TWO**

Session Two describes how the equipment is used to perform oxyfuel cutting, including the use of various gases, portable units, regulators, hoses, and cutting torches. This session covers Sections 2.4.0 through 3.4.2.

1. Show the Session Two PowerPoint® presentation.
2. Use the Kickoff Activity to review the information covered in the previous session.
3. Describe how to identify the specialized cutting equipment.
4. Describe how to properly prepare a torch for operation.
5. Describe how to leak-test oxyfuel equipment.
6. Describe how to light the torch and adjust for the proper flame.
7. Describe how to properly shut down oxyfuel cutting equipment.
**Session Three**

Session Three describes how to set up, light, and shut down oxyfuel equipment. This session covers Sections 4.0.0 through 4.4.3.

1. Show the Session Four PowerPoint® presentation.
2. Describe how to identify good cuts, inferior cuts, and their causes.
3. Describe how to cut thick steel and thin steel.
4. Describe straight, bevel, wash, and gouge techniques.
5. Describe how to make straight and bevel cuts with portable oxyfuel cutting machines.

**Sessions Four through Six**

Sessions Four through Six are laboratory sessions.

1. Note that no PowerPoint® presentation is associated with this laboratory session.
2. Demonstrate how to set up oxyfuel equipment, light and adjust the oxyfuel torch, and change empty cylinders.
3. Demonstrate cutting shapes in thin and thick steel using the various cutting techniques discussed.
4. Demonstrate how to shut down oxyfuel cutting equipment.
5. Trainees practice and complete the specific tasks required by Performance Tasks 1 through 9.
6. The completion of all Performance Tasks can also be used towards completion of the Performance Accreditation Task.

**Session Seven**

Session Seven is a review and testing session. Have trainees complete the Module Review Questions and Trade Terms Quiz. Alternatively, these may be assigned as homework at the end of Session Six. Go over the Module Review questions in class prior to the exam and answer any questions that the trainees may have.

1. Have trainees complete the written examination. Any outstanding performance testing must be completed during this session as well.
2. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.
### Materials Checklist for Module 29102-15, Oxyfuel Cutting

<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of usable and non-usable hoses</td>
<td>Pressure regulators</td>
</tr>
<tr>
<td>Appropriate flame-retardant clothing</td>
<td>Assorted thin steel pieces cut and exhibiting distortion</td>
</tr>
<tr>
<td>Safety glasses</td>
<td>Fuel gas cylinder</td>
</tr>
<tr>
<td>Welding gloves</td>
<td>Hose set</td>
</tr>
<tr>
<td>Appropriate goggles or face shield</td>
<td>Assorted torch tips (cutting, washing, and gouging)</td>
</tr>
<tr>
<td>Proper footwear as designated by the instructor or training facility provider</td>
<td>Files</td>
</tr>
<tr>
<td>Hearing protection as designated by the instructor or training facility provider</td>
<td>Tape measure or steel rule</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Common hand tools</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Friction lighters</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Approved leak testing solution</td>
</tr>
<tr>
<td><strong>Welding Level One</strong> PowerPoint® Presentation Slides</td>
<td>Sufficient carbon steel plate (≥¼” or 6 mm thick)</td>
</tr>
<tr>
<td>DVD player or a computer with a DVD drive</td>
<td>Portable oxyfuel track burner</td>
</tr>
<tr>
<td>Computer with internet access</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td></td>
</tr>
<tr>
<td>Module Review Question and Trade Terms Quiz answer keys</td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Architectural Sheet Metal

Course Planning Tools

Module 04307
Overview

This module introduces a variety of basic roofing components, including flashing, gutters, and downspouts, as well as the standing seam system used for many metal roofs. All these components work together to move water off a roof and keep it from penetrating into vulnerable areas. The included projects provide trainees an opportunity to practice their lay out, fabrication, and installation skills. Components such as roof decking panels, wall cap flashing, roof edge flashing, scuppers, and gutters are introduced, along with basic guidance for their fabrication and installation.

Learning Objective 1

Successful completion of this module prepares trainees to:

Identify and describe various roof characteristics and components.

   a. Identify and describe typical roofing materials.
   b. Describe the importance of roof pitch to drainage.
   c. Identify and describe various roof flashing components.
   d. Identify and describe the characteristics of gutters and downspouts.
   e. Describe the process of flashing a chimney.

Learning Objective 2

Successful completion of this module prepares trainees to:

Explain how to fabricate various sheet-metal roofing components.

   a. Explain how to fabricate a conductor elbow.
   b. Explain how to fabricate rectangular outlet tube.
   c. Explain how to fabricate and install rectangular gutter.
   d. Explain how to fabricate and install roof drainage components.
   e. Explain how to fabricate and install roof-edge and chimney flashing components.
   f. Explain how to fabricate and install metal roof panels and ridge caps.
g. Explain how to fabricate and install wall-cap, parapet, and fascia flashing components.

**Performance Tasks**

1. Lay out, develop a pattern, and fabricate a 60-degree two-piece conductor elbow.
2. Lay out and fabricate a rectangular outlet tube.
3. Lay out, fabricate, and install rectangular gutter.
4. Layout and fabricate flashing for a shingle roof.
5. Lay out and fabricate a typical metal coping profile.
6. Lay out, fabricate, and install three of the following:
   - Chimney flashing and cricket
   - Decking
   - Fascia
   - Flashing and counterflashing
   - Scupper
   - Wall-cap flashing
   - Wall pass-through

**Recommended Teaching Time:** 25 hours

**Classroom Equipment and Materials**

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 04307
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations

**Performance Task 1**

- Appropriate PPE as directed by the instructor or training facility provider
- One piece of 26-gauge galvanized sheet metal
- Soldering equipment and supplies
• Layout and development tools
• Slip roll-forming machine
• Aviation snips
• Combination square
• Flexible steel rule
• Circumference rule
• Steel square
• Performance Profile Sheets

**Performance Task 2**
• Appropriate PPE as directed by the instructor or training facility provider
• One piece of 26-gauge galvanized sheet metal
• #3 hand groover
• Bar folder
• Hand seamer
• Layout and development tools
• Aviation snips
• Combination square
• Flexible steel rule
• Circumference rule
• Steel square
• Soldering equipment and supplies
• Performance Profile Sheets

**Performance Task 3**
• Appropriate PPE as directed by the instructor or training facility provider
• Sufficient 26-ga. galvanized metal
• Box or pan brake
• Layout and development tools
• Squaring shear
• Combination square
• Flexible steel rule
• Circumference rule
• Steel square
• Performance Profile Sheets
Performance Task 4
- Appropriate PPE as directed by the instructor or training facility provider
- Sufficient 26-ga. galvanized metal
- Box or pan brake
- Layout and development tools
- Squaring shear
- Combination square
- Flexible steel rule
- Circumference rule
- Steel square
- Performance Profile Sheets

Performance Task 5
- Appropriate PPE as directed by the instructor or training facility provider
- One piece of 26-gauge galvanized metal, 24 inches wide
- Squaring shear
- Box or pan brake
- Layout and development tools
- Combination square
- Flexible steel rule
- Circumference rule
- Steel square
- Drawing of coping profile (Figure 68)
- Performance Profile Sheets

Performance Task 6
- Appropriate PPE as directed by the instructor or training facility provider
- Squaring shear
- Box or pan brake
- Layout and development tools
- Combination square
- Flexible steel rule
- Circumference rule
- Steel square
- Four pieces of 26-gauge galvanized steel
- Layout and development tools
• Soldering equipment
• Sealant
• Hammer and galvanized roofing nails
• Lead wedges
• Performance Profile Sheets
Shop Production and Organization

Course Planning Tools

Module 04401
Overview
To remain competitive in the construction industry, a sheet metal shop must continually strive to optimize the processes used to fabricate and prepare materials for field installation. Optimization includes attention to the physical layout of the shop, planning sessions related to the unique needs of current jobs, and the way that paperwork and digital documentation is accomplished. This module examines common production practices used in sheet metal shops and the importance of careful planning to best support the field installation activities.

Learning Objective 1
Successful completion of this module prepares trainees to:
Describe the preparations and planning that occur before sheet-metal shop production begins.

a. Describe the estimating process and its relationship to shop production.
b. Describe activities that are part of the planning phase.

Learning Objective 2
Successful completion of this module prepares trainees to:
Describe efficient sheet-metal shop operations and the equipment and personnel roles related to effective production.

a. Describe effective shop layouts.
b. Identify common interruptions in production and how they can be controlled.
c. Identify and describe automated shop equipment that supports productivity.
d. Identify common personnel roles and their relationship to each other in the shop environment.

Performance Tasks
This is a knowledge-based module; there are no Performance Tasks.
Recommended Teaching Time: 25 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 04401
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
Sheet Metal Business and Technology

Overview

The sheet metal and HVAC industries continue to become increasingly competitive. Today’s client expects projects to be finished faster and delivered at a lower cost. This highly competitive market is forcing the industry to find new ways to live up to those expectations. One way that many companies are doing so is by incorporating advancements in software and technology into their workflows. There are now various software tools and platforms that HVAC companies are using to enhance processes including design, estimation, fabrication, installation and project documentation. Since technology has become commonplace in the industry, understanding its importance and what it can do is important for all craftworkers.

Learning Objective 1

Successful completion of this module prepares trainees to:

Explain how various technologies influence the fabrication and installation of sheet metal.

a. Describe the use of CAD technology in sheet metal work.
b. Identify and describe the use of computer aids for duct fabrication.
c. Explain how 3D scanning is used in mechanical construction.

Learning Objective 2

Successful completion of this module prepares trainees to:

Describe technology used for construction project management and documentation.

a. Describe how estimating software is used for project bids.
b. Describe how software is used for construction project management and documentation.

Performance Tasks

This is a knowledge-based module; there are no Performance Tasks.

Recommended Teaching Time: 7.5 hours
Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 04407
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
Module 46101-17 teaches skills needed to become an effective crew leader, as well as knowledge and abilities required to transition from craftworker to crew leader. The module also covers workforce diversity and organization, basic leadership skills, safety, and project control.

**Objectives**

**Learning Objective 1**
- Describe current issues and organizational structures in industry today.
  a. Describe the leadership issues facing the construction industry.
  b. Explain how gender and cultural issues affect the construction industry.
  c. Explain the organization of construction businesses and the need for policies and procedures.

**Learning Objective 2**
- Explain how to incorporate leadership skills into work habits, including communications, motivation, team-building, problem-solving, and decision-making skills.
  a. Describe the role of a leader on a construction crew.
  b. Explain the importance of written and oral communication skills.
  c. Describe methods for motivating team members.
  d. Explain the importance of teamwork to a construction project.
  e. Identify effective problem-solving and decision-making methods.

**Learning Objective 3**
- Identify a crew leader’s typical safety responsibilities with respect to common safety issues, including awareness of safety regulations and the cost of accidents.
  a. Explain how a strong safety program can enhance a company’s success.
  b. Explain the purpose of OSHA and describe the role of OSHA in administering worker safety.
  c. Describe the role of employers in establishing and administering safety programs.
  d. Explain how crew leaders are involved in administering safety policies and procedures.

**Learning Objective 4**
- Demonstrate a basic understanding of the planning process, scheduling, and cost and resource control.
  a. Describe how construction contracts are structured.
  b. Describe the project planning and scheduling processes.
  c. Explain how to implement cost controls on a construction project.
  d. Explain the crew leader’s role in controlling project resources and productivity.

**Performance Tasks**

**Performance Task 1 (Learning Objective 4)**
- Develop and present a look-ahead schedule.

**Performance Task 2 (Learning Objective 4)**
- Develop an estimate for a given work activity.
Recommended Teaching Time: 22.5 hours

This Lesson Plan (LP) is divided into sections that correspond to the sections in the Trainee Guide module. As you plan your class times, review the objectives, content, and lesson plan outline for the section you plan to teach. Allow sufficient class time for demonstrations, laboratories, field trips, and testing. Each class period should also include time for administrative tasks and periodic breaks.

Be sure to gather the required equipment, materials, visual aids, and answer keys. Using your access code, download the PowerPoint® presentations and Performance Sheets for this module from NCCER’s Instructor Resource Center at www.nccerirc.com.

It is advisable to assign the reading of a module section prior to the classroom instruction. The Section Review and Module Review questions may be assigned as homework. At their discretion, instructors may assign additional homework to meet the teaching objectives.

Performance Testing may be administered at any suitable time in the course of the module training. Tasks are graded pass/fail. Trainee performance and proficiency during practice sessions that meets or exceeds the standards for a task can be accepted as Performance Task completion. Complete the Performance Profile Sheet for each trainee.

The final class is generally reserved for a brief review and the written module examination. For information about accessing the Module Examinations, visit www.nccer.org/testing. The passing score for submission into NCCER’s Registry is 70% or above for the written exam. Record the testing results for each trainee on the Registration of Training Modules form and submit the form to the Training Program Sponsor.

Classroom Equipment and Materials

| Whiteboard | LCD projector and screen |
| Markers | Computer with Internet access during class (optional) |
| Pencils and paper | Blank copies of a look-ahead schedule |
| Fundamentals of Crew Leadership | Module Review answer key |
| PowerPoint® Presentation | Module examinations |
| | Performance Profile Sheets |
**Additional Resources**

This module presents thorough resources for task training. The following reference material is recommended for further study.


The following websites offer resources for products and training:

- Aging Workforce News, [www.agingworkforcenews.com](http://www.agingworkforcenews.com)
- American Society for Training and Development (ASTD), [www.astd.org](http://www.astd.org)
- Architecture, Engineering, and Construction Industry (AEC), [www.aecinfo.com](http://www.aecinfo.com)
- Equal Employment Opportunity Commission (EEOC), [www.eeoc.gov](http://www.eeoc.gov)
- National Association of Women in Construction (NAWIC), [www.nawic.org](http://www.nawic.org)
- National Census of Fatal Occupational Injuries (NCFOI), [www.bls.gov](http://www.bls.gov)
- National Institute of Occupational Safety and Health (NIOSH), [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- National Safety Council, [www.nsc.org](http://www.nsc.org)
- Occupational Safety and Health Administration (OSHA), [www.osha.gov](http://www.osha.gov)
- Society for Human Resources Management (SHRM), [www.shrm.org](http://www.shrm.org)
- United States Census Bureau, [www.census.gov](http://www.census.gov)
- United States Department of Labor, [www.dol.gov](http://www.dol.gov)
- US Green Building Council (USGBC), [www.usgbc.org/leed](http://www.usgbc.org/leed)
- Wi-Fi® is a registered trademark of the Wi-Fi Alliance, [www.wi-fi.org](http://www.wi-fi.org)

There are a number of online resources available for trainees who would like more information on effective leadership skills and professionalism in the construction industry. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide examples of both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the internet, make personal videos, and take still pictures related to the subject matter and add them to the PowerPoint® presentations throughout the program.