Pipefitting

MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Orientation to the Pipefitting Craft (5 Hours)
(Module ID 08101) Provides an overview of work performed by the pipefitter, as well as the responsibilities, career opportunities, safety principles associated with the pipefitting trade, and the types of pipes and tools pipefitters will encounter.

Pipefitting Hand Tools (20 Hours)
(Module ID 08102) Covers hand tool safety as well as procedures for selecting, inspecting, using, and maintaining hand tools used by pipefitters. Introduces the most common hand tools used in pipefitting, including pipe wrenches, pipe stands, pipe vises, levels, pipe fabrication tools, pipe bending tools, and pipe joining tools.

Pipefitting Power Tools (15 Hours)
(Module ID 08103) Covers the safe operation of power tools used to cut, grind, thread, and shape all types of materials, and includes procedures for selecting, inspecting, using, and maintaining power tools used by pipefitters. Provides guidelines for using electrical and pneumatic tools, including pipe threading machines.

Identifying and Installing Valves (20 Hours)
(Module ID 08203) Identifies different types of valves, including those that start and stop flow, regulate flow, regulate flow direction, and relieve pressure, and describes their installation as well as proper storage and handling procedures. Covers common valve operators and actuators.

Pipefitting Trade Math (15 Hours)
(Module ID 08204) Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Threaded Pipe Fabrication (15 Hours)
(Module ID 08205) Describes the materials used in threaded piping systems. Explains how to determine pipe lengths between threaded pipe fittings, prepare the pipe and fittings for fit-up, and assemble the piping system. Includes how to calculate simple and rolling offsets.

Oxyfuel Cutting (17.5 Hours)
(Module ID 29102) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, beveling, washing, and gouging.

Ladders and Scaffolds (12.5 Hours)
(Module ID 08105) Describes hazards and safety procedures governing the use of stepladders, extension ladders, fixed scaffolds, and rolling scaffolds. Includes general procedures for scaffold assembly and use.

Motorized Equipment One (10 Hours)
(Module ID 08106) Explains the safety factors, operator maintenance, and operating procedures associated with motorized equipment used on job sites. Covers electrical generators, air compressors, aerial lifts, forklifts, trenchers, backhoes, mobile cranes, and portable equipment including welding machines, pumps, and compactors.

Excavations (10 Hours)
(Module ID 08208) Explains soil and trenching hazards involved in excavations, as well as the use of shoring and shielding systems per OSHA standards, sloping requirements by soil type, and combined systems for trench reinforcement. Covers how to determine grade and elevation, how to use a laser level, and how to backfill.

Underground Pipe Installation (20 Hours)
(Module ID 08209) Explains pipe installation procedures and guidelines, including the procedures for cast iron, ductile iron, concrete, carbon steel, fiberglass, and thermoplastic pipe. Includes an introduction to horizontal directional drilling for pipe installation, and the use of a weak link for plastic pipe.

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### Pipefitting Level 3

**MODULES**

- **Networking and Troubleshooting**
  - (Module ID 00501) Covers the importance of networking and troubleshooting in the industry.
  - (Module ID 00502) Discusses network and troubleshooting skills.
- **Testing Piping Systems and Equipment**
  - (Module ID 08401) Explains the use of ordinate tables and trigonometry in creating fittings and pipe assemblies for process applications.
  - (Module ID 08402) Provides details on environmental and other concerns associated with hot tapping.
- **Hot Taps**
  - (Module ID 08403) Discusses how to replace packing and O-rings, and how to open and close a valve’s bonnet.
- **Advanced Pipe Fabrication**
  - (Module ID 08408) Explains how to remove cross drilled holes and installing flanged and grooved pipe, fabricating and installing pipe spools, and installing pipe sleeves and floor penetrations.
- **Stress Relieving and Aligning**
  - (Module ID 08409) Provides information on calculating piping offsets, fabricating miter turns, laying out and fabricating saddles and supports made out of pipe, and laying out laterals, wyes, ninety-degree intersections, and supports without using references.

### Pipefitting Level 4

**MODULES**

- **Field Routing and Vessel Trim**
  - (Module ID 08401) Explains the importance of safety and following procedures with testing and inspections.
- **Motorized Equipment Two**
  - (Module ID 08402) Covers the use of computing and handling hydraulic compression joints, and managing procedures.
- **Testing Piping Systems and Equipment**
  - (Module ID 08403) Identifies various types of pipe, flanges, gaskets, and bolts.
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  - (Module ID 08404) Describes the purpose of stress relieving and covers thermal expansion in piping, temperature and metal structure, and stress relief for aligning pipe to rotating equipment.
- **In-Line Specialties**
  - (Module ID 08405) Provides basic information related to rigging and rigging hardware, such as slings, rigging hitches, and hoists. Emphasizes safe working habits in the vicinity of rigging operations.
- **Field Routing and Vessel Trim**
  - (Module ID 08406) Identifies various types of pipe, flanges, gaskets, and bolts.
- **Testing Piping Systems and Equipment**
  - (Module ID 08407) Discusses methods of assembling copper pipe, handling hydraulic compression joints, and managing procedures.
- **Stress Relieving and Aligning**
  - (Module ID 08408) Provides information on calculating piping offsets, fabricating miter turns, laying out and fabricating saddles and supports made out of pipe, and laying out laterals, wyes, ninety-degree intersections, and supports without using references.

**L3 PIPEFITTING**

**Curriculum Notes**

- 152.5 Hours
- Updated in 2019.
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

**PAPERBACK**


**L4 PIPEFITTING**

**Curriculum Notes**

- 175 Hours (required): 197.5 Hours (with Fundamentals of Crew Leadership elective)
- Updated in 2019.
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

**PAPERBACK**


### Additional Resources

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