

# PIPEFITTER

## APPENDIX A

O\*NET CODE 47-2152.01

This training outline is a minimum standard for Work Processes and Related Instruction. Changes in technology and regulations may result in the need for additional on-the-job or classroom training.

### WORK PROCESSES

	<b>Approximate Hours</b>
<b>A. Materials</b>	<b>212 – 250</b>
1. Reading blueprints and specifications.	
2. Understanding written and verbal work orders.	
3. Recognizing and selecting appropriate types and sizes of pipe and fittings.	
4. Recognizing and selecting appropriate related materials and equipment, such as valves, supports, fasteners.	
<b>B. Layout</b>	<b>638 – 750</b>
1. Inspecting work site to determine presence of obstructions and to ascertain that holes cut for pipe will not cause structural weakness.	
2. Planning installation or repair to avoid obstructions and to avoid interfering with activities of other workers.	
3. Planning and marking layout.	
4. Minimizing waste of materials.	
5. Coordinating with other trades.	
<b>C. Rigging and Signaling</b>	<b>170 – 200</b>
1. Understanding and utilizing standard construction site signals.	
2. Safely unloading materials.	
3. Safely using ladders and scaffolding.	
4. Safely using power lifts and personnel lifts.	
5. Working safely in trenches.	
6. Shoring trenches with plywood (if in keeping with prevailing area practice.)	

7. Shoring trenches with aluminum hydraulic system (if in keeping with prevailing area practice).

**D. Assembly and Installation**

**2,805 – 3,300**

1. Cutting openings as required, using hand and power tools.
2. Measuring and marking metallic and non-metallic pipe.
3. Cutting metallic and non-metallic pipe, using hand and power tools.
4. Threading pipe, using pipe threading machine.
5. Bending metallic and non-metallic pipe, using hand and power tools.
6. Joining metallic and non-metallic pipe, using hand and power tools for threading, soldering, brazing, fusing, welding or other approved processes.
7. Hanging and supporting pipe and related materials.
8. Installing related equipment and making piping connections.
9. Increasing pressure in pipe system.
10. Testing of all components of installed systems, using pneumatic or hydrostatic testing procedures.

**E. Soldering and Brazing**

**510 – 600**

1. Soldering, using various alloys.
2. Brazing, using various alloys.

**F. Cutting and Welding**

**680 – 800**

1. Oxy-fuel cutting.
2. Oxy-fuel welding.
3. Shielded metal-arc welding.
4. Tungsten inert gas arc welding (TIG).
5. Metallic inert gas arc welding (MIG).
6. Orbital welding.
7. Stainless welding, if available.
8. Aluminum welding, if available.

**G. Automatic Controls**

**170 – 200**

1. Installing manual and automatic controls that regulate piping systems, up to the point of conversion to an electric signal.

<b>H. Boilers and Furnaces</b>	<b>425 – 500</b>
1. Assembling and installing boilers.	
2. Assembling and installing furnaces.	
<b>I. Steam Systems</b>	<b>425 – 500</b>
1. Installing low pressure systems.	
2. Installing high pressure systems.	
3. Installing steam traps and other related equipment.	
<b>J. Hot Water Heating Systems</b>	<b>425 – 500</b>
1. Installing residential hot water heating systems.	
2. Installing commercial and industrial hot water heating systems.	
<b>K. Cooling Systems (Refrigeration and Air Conditioning)</b>	<b>425 – 500</b>
1. Assembling and installing industrial refrigeration systems.	
2. Assembling and installing residential air conditioning systems.	
3. Assembling and installing commercial air conditioning systems.	
<b>L. Lubricating Systems (optional)**</b>	<b>340 – 400</b>
1. Assembling and installing automatic lubrication systems.	
<b>M. Industrial Production and Processing Systems (optional)**</b>	<b>425 – 500</b>
1. Assembling and installing process piping systems using steam, hot water, hydraulic or pneumatic components and equipment.	
<b>N. Powerhouse and Electric Generating Systems (optional)**</b>	<b>425 – 500</b>
1. Installing piping and devices that have pipe connections to them.	
<b>O. Maintenance and Repair</b>	<b>425 – 500</b>
1. Using proper startup and shutdown procedures.	
2. Maintaining, repairing and modifying installed piping systems and components.	
<b>Approximate Total Hours</b>	<b>8,500 – 10,000</b>

\*This Apprenticeship program is to last five years.

\*\*If optional components are not selected, their hours should be devoted to further mastery of required components.

Apprenticeship work processes are applicable only to training curricula for apprentices in approved programs. Apprenticeship work processes have no impact on classification determinations under Article 8 or 9 of the Labor Law. For guidance regarding classification for purposes of Article 8 or 9 of the Labor Law, please refer to <https://dol.ny.gov/public-work-and-prevailing-wage>

**PIPEFITTER**  
**APPENDIX B**  
**RELATED INSTRUCTION**

**Safety**

1. All Applicable OSHA Regulations, Standards and Rules
2. OSHA 10-Hour Construction Course – if required for Public Work
3. Proper Use of Personal Protective Equipment
4. Fall Protection
5. Proper Lifting Techniques
6. Proper Handling, Storage and Disposal of All Work-Related Chemicals
7. Working Safely in Confined Spaces
8. Asbestos Awareness – minimum 4 hours (see attachment)
9. First Aid (minimum 6.5 hours, every 3 years)
10. Sexual Harassment Prevention Training – must comply with section 201-g of the Labor Law

**Industrial and Labor Relations (20 hours)**

1. History and Background (6 hours, 1st year)
2. Current Laws and Practices (14 hours, 2nd year)

**Mathematics**

1. Basic Math
2. Trade Math (including pipe measurements, instruments used for piping systems layout)

**Drawing Interpretation and Plan Reading**

1. Reading Drawings, Diagrams and Trade-Related Symbols
2. Interpreting Building Plans
3. Reading Building Specifications
4. Introduction to Basic Drawing Skills
5. Advanced Plan Reading and Related Drawing, including computer aided drafting (CAD)

**Trade Theory and Science**

1. Trade-Related Science (Physics and Chemistry)

2. Basic Electricity
3. Use and Care of Tools and Equipment
4. Materials of the Trade (including pipe, pipe fittings, pipe supports and valves)
5. Local Mechanical Codes, Ordinances and Regulations
6. Soldering and Brazing
7. Cutting and Welding
8. Rigging and Signaling
9. Manual and Automatic Controls
10. Steam Systems
11. Pumps
12. Refrigeration
13. Conservation and Safe Handling of Refrigerants
14. EPA Certification: Core, Type I, Type II, Type III and Universal
15. Hydronic Heating and Cooling
16. Air Conditioning
17. Valve Repair
18. Starting, Testing and Balancing
19. Instrumentation and Process Control

**Other Related Courses as Necessary**

A minimum of 216 hours of Related Instruction are required for each Apprentice, for each year of the five years of the Apprenticeship, for a minimum total of 1080 hours.

Appendix B topics are approved by New York State Education Department.

## ATTACHMENT TO APPENDIX B

### Asbestos Awareness

This course must be delivered by one of the following:

1. A provider currently approved by the New York State Department of Health to deliver asbestos safety training.
2. A person holding a current Asbestos Handler certificate from the New York State Department of Labor in the title of: Inspector, Supervisor, Project Monitor, Management Planner, or Project Designer.
3. Anyone otherwise approved by the New York State Education Department.

Minimum course contents must include the following:

1. Definition of asbestos
2. Types and physical characteristics
3. Uses and applications
4. Health effects:
  - a. Asbestos-related diseases
  - b. Risks to families
  - c. Cigarette smoking
  - d. Lack of safe exposure level
5. Employer-specific procedures to follow in case of potential exposure, including making a supervisor or building owner immediately aware of any suspected incidental asbestos disturbance so that proper containment and abatement procedures can be initiated promptly.

**Notwithstanding the above course requirement, employers are advised that they must also be in compliance with New York State Department of Labor Industrial Code Rule 56 at all times.**

**Employers are further advised, and must advise all apprentices, that completion of the above course requirement does not authorize any person to remove, encapsulate, enclose, repair, disturb, or abate in any manner, any friable or non-friable asbestos, asbestos containing material, presumed asbestos containing material, or suspect miscellaneous asbestos containing material.**