

PLUMBING I & II

Program Description: The Plumbing course of study provides students with an opportunity to learn the theory and skills necessary to be successful in the world of work or post secondary education/training. Students will master a variety of competencies related to the plumbing profession. A major emphasis will be placed on hands on experiences and completion of projects. Program standards from the National Center for Construction Education and Research (NCCER) will be utilized. All students must pass the NCCER Core Safety examination prior to performing projects in the laboratory setting. All students will be required to wear protective clothing and gear appropriate for work in the plumbing industry.

Module 1: Introduction to the Plumbing Profession

Unit Objective: Students will demonstrate a basic understanding of the Plumbing profession.

Unit Competencies:

1. Describe the history of the plumbing profession.
2. Identify the responsibilities of a person working in the plumbing industry.
3. Identify the stages of progress within the plumbing profession and its positive impact on society.

Module 2: Plumbing Safety/Tools

Unit Objective: Students will demonstrate competency in safety specific to the plumbing industry.

Unit Competencies:

1. Describe the common unsafe acts and unsafe conditions that cause accidents.
2. Describe how to handle unsafe acts and unsafe conditions.
3. Demonstrate the use and care of appropriate personal protective equipment.
4. Identify hazardous job-site work specific to plumbers.
5. Demonstrate the proper use of ladders.
6. Demonstrate how to use and maintain power tools safely.
7. Demonstrate the ability to know when and how to select the proper tools for the task.
8. Describe and demonstrate the lockout/tagout process

Module 3: Introduction to Plumbing Math

Unit Objective: Students will be able to perform mathematical problems necessary to the plumbing profession.

Unit Competencies:

1. Explain the metric system and how it is important in the plumbing trade.
2. Square various numbers and take square roots of numbers, with and without a calculator.
3. Identify the parts of fittings and use common pipe-measuring techniques.
4. Use fitting dimension tables to determine fitting allowances and thread makeup.
5. Calculate end-to-end measurements using fitting allowances and thread makeup.

Module 4: Introduction to Plumbing Drawings

Unit Objective: Students will demonstrate the ability to read and interpret drawings specific to residential and commercial plumbing.

Unit Competencies:

1. Identify and interpret pictorial (isometric and oblique), schematic, and orthographic drawings.
2. Identify the basic symbols used in schematic drawings of pipe assemblies.
3. Interpret plumbing-related information from a set of plumbing drawings.
4. Demonstrate the ability to sketch orthographic and schematic drawings.
5. Use an architect's scale to draw lines to scale and to measure lines drawn to scale.
6. Read and interpret code requirements and how they apply to drawings.

Module 5: Plastic Pipe and Fittings

Unit Objective: Students will demonstrate competency in the use and application of plastic pipe and fittings.

Unit Competencies:

1. Identify types of materials and schedules of plastic piping.
2. Identify proper and improper application of plastic piping.
3. Identify types of fittings and valves used with plastic piping.
4. Identify and determine the kinds of hangers and supports needed for plastic piping.
5. Correctly measure, cut and join plastic piping.
6. Demonstrate proper procedures for the handling, storage and protection of plastic pipes.

Module 6: Copper Pipe and Fittings

Unit Objective: Students will demonstrate competency in working with copper pipe and fittings.

Unit Competencies:

1. Identify the types of materials and schedules used with copper piping.
2. Identify the material properties, storage, and handling requirements of copper piping.
3. Identify the types of fittings and valves used with copper piping.
4. Identify the techniques used in hanging and supporting copper piping.
5. Accurately measure, ream, cut and join copper piping.
6. Identify the hazards and safety precautions associated with copper piping.

Module 7: Cast-Iron Pipe and Fittings

Unit Objective: Students will demonstrate competency in working with cast iron pipe and fittings.

Unit Competencies:

1. Recognize proper and improper applications of cast-iron piping.
2. Identify the material properties, storage and handling requirements of cast-iron piping.
3. Identify the types of materials and schedules used in cast-iron piping.

4. Identify the types of fittings used with cast-iron piping.
5. Demonstrate the various techniques used in handling and supporting, cast-iron piping.
6. Accurately measure, cut and join cast-iron piping.
7. Identify the hazards and safety precautions associated with cast-iron piping.

Module 8: Carbon Steel Pipe and Fittings

Unit Objective: Students will demonstrate competency in working with carbon steel pipe and fittings.

Unit Competencies:

1. Recognize proper applications of carbon steel piping.
2. Identify the material properties, storage, and handling requirements of carbon steel piping.
3. Identify the various techniques used in hanging and supporting carbon steel piping.
4. Accurately measure, cut, groove, thread and join carbon steel piping.

Module 9: Fixtures and Faucets

Unit Objective: Students will demonstrate an understanding of the materials used in and applications for basic fixtures and faucets.

Unit Competencies:

1. Identify the basic types of materials used in the manufacture of plumbing fixtures.
2. Recognize the common types of sinks, lavatories, and faucets.
3. Identify and discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.
4. Discuss common types of toilets, urinals and bidets.
5. Identify and describe the common types of drinking fountains and water coolers.
6. Identify common types of garbage disposals and domestic dishwashers.

Module 10: Introduction to Drain, Waste, and Vent (DWV) Systems

Unit Objective: Students will demonstrate an understanding of the components and functions of various drain, waste and vent systems.

Unit Competencies:

1. Explain how waste moves from a fixture through the drain system to the environment.
2. Identify the major components of a drainage system and describe their functions.
3. Identify the different types of traps and their components, explain the importance of traps and identify the ways that traps can lose their seals.
4. Identify the various types of drain, waste and vent (DWV) fittings and describe their applications.
5. Identify significant code and health issues, violations and consequences related to DWV systems.

Module 11: Introduction to Water Distribution Systems

Unit Objective: Students will demonstrate an understanding of water distribution systems and their functions.

Unit Competencies:

1. Describe the process in which water is distributed in municipal, residential, and private water systems.
2. Identify the major components of a water distribution system, and describe the function of each component.
3. Explain the relationships between components of a water distribution system.

Certifications:

NCCER Safety

OSHA-10 Safety

Articulation Agreements:

Local 5, Ironworkers Union, Local 602 Steamfitters Union