

APPT 123: RESIDENTIAL GAS & WATER INSTALLATIONS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	2.5
Hours:	18 lecture, 36 laboratory per quarter (54 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Residential Plumbing Apprenticeship Program.
Advisory:	Current employment in the pipe trades industry.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- A student will be able to describe process required for sizing fuel gas piping.
- A student will be able to identify approved gas piping materials.
- A student will be able to identify common types of water heaters.

Description

Overview of the installation and design criteria of residential hot and cold water, and fuel gas installations. Includes piping materials and hanger systems, material handling, and environmental concerns.

Course Objectives

The student will be able to:

1. Describe safe and efficient material handling techniques
2. Identify the environmental aspects of proper plumbing practices
3. Demonstrate proper cutting, joining, and support of steel pipe
4. Describe the properties of fuel gases and proper piping installations
5. Demonstrate methods of structural penetration and fire caulking
6. Identify potable water supply source, treatment, and distribution methods

Course Content

1. Safe and efficient material handling techniques
 - a. Describe causes and prevention strategies for muscle strains and sprains
 - b. Define causes and prevention strategies for back safety
 - c. Describe procedures for operating hoisting equipment
 - d. Identify common sling configurations
2. Identify the environmental aspects of proper plumbing practices

- a. Describe policies and procedures related to environmental management systems
 - b. Define procedures for dealing with storm water
 - c. Describe policies and procedures for lead safety
 - d. Define methods currently being taken to protect San Francisco Bay
3. Demonstrate proper cutting, joining, and support of steel pipe
 - a. Describe methods for measuring steel pipe and fittings
 - b. Join steel pipe with threaded fittings and grooved joints
 - c. Install threaded and grooved joints on steel pipe
 - d. Describe requirements for pipe hanging and support systems
 - e. Identify uses of pipe guides and anchors
 4. Describe the properties of fuel gases and proper piping installations
 - a. Identify the characteristics of fuel gas
 - b. Define and identify terms in gas piping installations
 - c. Identify approved gas piping materials
 - d. Describe approved joining and installation methods
 - e. Identify testing methods and requirements
 - f. Calculate fuel gas pipe sizes
 5. Demonstrate methods of structural penetration and fire caulking
 - a. Identify common fire-stop materials
 - b. Describe methods of fire-stop installation
 - c. Cut, drill, and fire-stop pipe
 6. Identify potable water supply source, treatment, and distribution methods
 - a. Identify characteristics of water
 - b. Identify water purification methods and water treatment equipment
 - c. Describe water main types, piping materials, and joining methods
 - d. Define water service piping system
 - e. Describe building water distribution systems
 - f. Calculate building water distribution pipe sizing
 - g. Identify common water distribution system problems and methods of correction
 - h. Describe difference between potable and non-potable piping
 - i. Identify UPC code requirements in reference to cross connection control

Lab Content

1. Use personal protective equipment
2. Cut and assemble steel gas pipe
3. Prepare grooved ends for grooved pipe assembly

Special Facilities and/or Equipment

1. Personal protective equipment
2. Laboratory with plumbing tools

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of written exercises, short quizzes, and end of session and end of module assessment

Satisfactory completion of hands-on projects

Maintenance of a student's workbook with questions drawn from text

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
Lab assignment
Group discussion
Demonstration

Representative Text(s) and Other Materials

International Pipe Trades Joint Training Committee, Inc.. [Related Math](#). 2016.

Ripka, L.V.. [Plumbing Design and Installation, 4th ed.](#). 2012.

International Pipe Trades Joint Training Committee. [UA Pipe Fittings, Valves, Supports and Fasteners](#). 2015.

International Pipe Trades Joint Training Committee, Inc.. [Rigging](#). 2014.

International Pipe Trades Joint Training Committee, Inc.. [Gas Installations](#). 2016.

International Association of Plumbing and Mechanical Officials. [Uniform Plumbing Code](#). 2015.

International Pipe Trades Joint Training Committee, Inc.. [Water Supply](#). 2017.

International Pipe Trades Joint Training Committee, Inc.. [Related Science](#). 2014.

These are the standard textbooks/workbooks used for this course. Although they are older than 5 years, they are the most current books used when teaching this course.

Summit Training Source. [Environmental Management System](#) (video)

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Readings from assigned textbook
 - a. Sizing Water Supply Piping, chapter 10
 - b. Protecting the Potable Water, chapter 11
2. Writing assignments given in the laboratory
 - a. Answer study questions in assigned text, chapters 10 and 11
 - b. Create sizing diagram for domestic water piping system

Discipline(s)

Plumbing