APPT 126: RESIDENTIAL PIPING LAYOUT & INSTALLATION; RESIDENTIAL FIXTURES

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 identify the purpose and function of a backflow device.
- A student will be able to identify special tools used for fixture installation.
- A student will be able to describe operation of water closets.

Description

Introduction to the various methods of inserting and sleeving in residential construction. Students practice the layout and installation of residential copper pipe and tube systems. Provides hands-on practice of plumbing fixture installation, service, and repair.

Course Objectives

The student will be able to:

1. Demonstrate piping layout methods
2. Describe residential copper pipe and tube installations
3. Identify residential valves and back flow devices
4. Demonstrate installation and servicing of residential fixtures

Course Content

1. Piping layout methods
    a. Coordinate plumbing, architectural, structure, and mechanical drawings
    b. Create material list
    c. Demonstrate use of cut sheets and fitting books
    d. Sketch a basic isometric by hand
    e. Transfer a scaled drawing to an actual installation
    f. Measure elevations with ruler, line, and hand level
    g. Measure elevations, depth, and horizontal angles using a transit or builder's level
    h. Grade and align pipelines using pipe laser
2. Copper pipe and tube installation
    a. Describe methods of fire prevention
    b. Identify the common types of fittings used with copper tubing
    c. Describe the manufacture and materials of copper pipe and copper tubing
    d. Describe the types of solders used for joining copper tube
    e. Describe the types of brazing filler metals used for joining copper tube
    f. Describe the types of fluxes used for soldering and brazing copper tube
    g. Prepare and assemble copper joints
    h. Make a soldered joint and perform soldering joint test
    i. Make a brazed joint and perform a brazed joint test
3. Residential valves and back flow devices
    a. Identify and select the appropriate valve for a particular application
    b. Install a main supply shut off valve
    c. Install and/or replace a defective valve
    d. Replace various valve components
    e. Install a variety of valves properly
    f. Install a reduced pressure back flow device
    g. Install a double check valve assembly
    h. Install a pressure vacuum breaker
    i. Identify the purpose and function of a back flow device
    j. Describe the potential hazards of not installing proper back flow prevention
4. Installation and servicing of residential plumbing fixtures
    a. General safety, sanitary, and Americans with Disabilities Act regulations
    b. Plumbing code requirements
    c. Special tools and equipment for setting fixtures
    d. Select and install anchors, fasteners, backing, and carriers
    e. Installation procedures for plumbing fixtures, faucets, and flush valves
    f. Installation and code requirements for water heaters
    g. Hot water return circulating pumps
    h. Maintenance, troubleshooting, and repairs for fixtures, faucets, and flush valves
    i. Maintenance, troubleshooting, and repairs for water heaters
    j. Drain line service

Lab Content

1. Layout drainage system
2. Install floor mounted water closet
3. Solder copper tube assembly

Special Facilities and/or Equipment

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
Class participation
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 assignments
Group discussions
Demonstrations

Representative Text(s) and Other Materials

International Pipe Trades Joint Training Committee, Inc.. Related Math. 2016.

United Association of Journeyworkers and Apprentices. Plumbing Fixtures and Appliances. 2009.

Ripka, L.V.. Plumbing Design and Installation, 4th ed. with workbook. 2012.

International Pipe Trades Joint Training Committee, Inc.. UA Pipe Fittings, Valves, Supports and Fasteners. 2015.

International Pipe Trades Joint Training Committee, Inc.. Soldering and Brazing. 2015.

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.

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

1. Readings from assigned textbook
    a. Manufacturer's specifications
2. Writing assignments given in the laboratory
    a. Quizzes on assembly and repair techniques
    b. List and describe function of components of a flushometer valve

Discipline(s)

Plumbing