

APPT 121A: SP-101 BASIC PLUMBING SERVICE SKILLS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Fall 2026
Units:	7.5
Hours:	82 lecture, 36 laboratory per quarter (118 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPR 110 or APPT 131.
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

- By the end of this course, learners will be able to safely select and use common plumbing tools and materials while following established job site safety practices
- By the end of this course, learners will be able to cut, join, and assemble piping systems using proper techniques for multiple pipe types in accordance with industry standards
- By the end of this course, learners will be able to identify basic plumbing system components and successfully perform fundamental service tasks, including clearing minor clogs and repairing leaky fixture

Description

This course provides an introduction to the plumbing service and repair apprenticeship program, including an overview of JATC policies, procedures, and expectations. Apprentices will learn about the history and heritage of the United Association (UA) to build awareness of the trade's legacy and values. Foundational safety training is introduced, with a focus on general construction safety practices relevant to plumbing service and repair. Instruction then progresses to essential trade skills, including the proper use and care of hand and power tools, basic pipe and tubing installation methods, and techniques such as soldering and brazing. This course lays the groundwork for success in both classroom instruction and on-the-job training.

Course Objectives

The student will be able to:

1. Describe the apprenticeship process
2. Describe Union Heritage
3. Work safely on the job
4. Demonstrate proficiency in the use of common tools

5. Demonstrate proficiency in pipe joining and installation skills
6. Perform soldering and brazing

Course Content

1. Describe the apprenticeship process
 - a. Training Center facility and staff
 - b. JATC policies and procedures
2. Describe Union Heritage (UA)
 - a. History of the UA
 - b. Identify partners in an apprenticeship
 - c. The collective voice
 - d. Role and responsibilities of contractors
 - e. Characteristics and goals of outstanding journeymen
3. Work safely on the job
 - a. Purpose and responsibilities of OSHA
 - b. Workplace hazards
 - c. Fall protection
 - d. Personal protective equipment (PPE)
 - e. Electrical safety, tool safety, stairway and ladder safety
 - f. Proper methods for lifting and carrying objects
 - g. Safety issues related to excavation
 - h. Confined spaces
 - i. Fire safety
4. Demonstrate proficiency in the use of common tools
 - a. Identify types of and use of various tools
 - b. Measuring tools
 - c. Properly use pipe cutting tools
 - d. Properly use pipe reaming tools
 - e. Properly use drilling tools
 - f. Properly use pipe boring tools
 - g. Recognize and use digging and lifting tools
5. Demonstrate proficiency in pipe joining and installation skills
 - a. Describe common terms associated with steel pipe
 - b. Identify the various types of steel pipe and fittings
 - c. Steel pipe threading and joining
 - d. Flanged method of joining steel pipe
 - e. Use the grooved coupling method of joining steel pipe
 - f. Identify and properly use plastic pipe fittings
 - g. Identify cast iron pipe and nomenclature
 - h. Cut and join cast iron pipe
 - i. Identify the types and uses of fittings
 - j. Components and functions of hangers
 - k. Tube bending procedures
 - i. Pressure testing
6. Perform soldering and brazing
 - a. Identify the common types of fittings used with copper tubing
 - b. Describe the manufacture and materials of copper pipe
 - c. Types of solder used for joining copper tube
 - d. Types of brazing filler metal used for joining copper tube
 - e. Types of flux used for soldering and brazing copper tube
 - f. Prepare and assemble copper joints

- g. Perform soldering process
- h. Make a brazed joint

Lab Content

Students will engage in both individual and team-based activities focused on the safe installation and joining of components in waste and water piping systems. Emphasis will be placed on tool safety and proper construction site practices, including hazard recognition, personal protective equipment (PPE), and safe material handling.

Lab work will include hands-on training in the use and maintenance of plumbing tools, as well as practical exercises in assembling and repairing various types of piping systems. Students will also participate in live demonstrations by industry vendors, who will present specialized tools and equipment, discuss best practices, and reinforce safe operation techniques. These demonstrations will enhance students' understanding of real-world applications and prepare them for job site expectations.

Special Facilities and/or Equipment

1. Laboratory with plumbing tools.
2. Personal protective equipment.
3. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address.

Method(s) of Evaluation

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

Results of written exercises and final examination
Satisfactory completion of hands-on projects
Maintenance of a student's workbook with questions drawn from text
Group and classroom participation

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. Standard for Excellence (updated). 2017.

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

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

International Association of Plumbing and Mechanical Officials. Uniform Plumbing Code. 2022.

Although some of these texts are older than the recommended five-year guideline, they align with current training standards and are widely recognized as foundational works in the plumbing discipline. We will adopt the most recent edition of each text as soon as it becomes available.

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

1. Readings from assigned textbooks:
 - a. Articles and lessons on Union Heritage, chapters 1-3
 - b. Laws and manuals containing safety rules and regulations for various pertinent agencies
2. Writing assignments given in the laboratory:
 - a. Essays on the development, impact, and importance of unions in the United States
 - b. Essay and exams on the importance of safety rules and regulations governing construction

Discipline(s)

Plumbing