ATPL-2807: SPECIAL TOPICS: INSTALLATION TECHNIQUES FOR PVC

Cuyahoga Community College

Viewing: ATPL-2807 : Special Topics: Installation Techniques for PVC

Academic Term:
Fall 2026

Subject Code
ATPL - Applied Ind Tech - Plumbers

Course Number:
2807

Title:
Special Topics: Installation Techniques for PVC

Catalog Description:
This course is designed to demonstrate and qualify the students in the multiple installation practices of polyvinyl chloride (PVC) pipe. Tool use, safety practices, pipe and fitting identification, drawing use, and applied mathematics will all be covered in this course as it relates to the installation techniques of PVC pipe.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Departmental approval admission to program.

Outcomes

Course Outcome(s):
Identify the basic and advanced tools used in the installation of PVC pipe, pipe fittings, and connections.

Objective(s):
1. List the various hand and power tools required for PVC installation.
2. Differentiate between basic and advanced tools.
3. Identify the different pipes and pipe fittings for PVC and compare them to cast iron pipes and fittings.
4. Discuss the different installation techniques used to install and connect pipes and fittings.
5. Compare PVC cementing operations with mechanical connections.
6. Describe the cementing processes that are used to connect PVC pipe and fitting for drainage line installations.

Course Outcome(s):
Discuss the safety procedures as prescribed by the Occupational Safety and Health Administration (OSHA) and the PVC Pipe Association for worker protection.

Objective(s):
1. Identify the hazards related to working with PVC.
2. Discuss the procedures used to protect the worker during PVC installations.
3. List the Personal Protection Equipment (PPE) as prescribed by OSHA, required for safe PVC installations.
4. Discuss the respiratory risks caused by fumes generated during PVC cementing and cutting operations.

Course Outcome(s):

Interpret civil, mechanical drawings and schematics and review related math concepts for material estimating, layout procedures and pipe locations.

Objective(s):

1. Identify Drainage line requirements as shown on construction drawings.
2. Differentiate between civil, mechanical drawings, and schematics.
3. Determine pipe locations in floors, walls, and ceilings from plans and specifications.
4. Estimate quantities of pipe and pipe fittings required for mechanical installations.
5. Establish different lists required for materials, tools, and equipment.
6. Review trade-related math concepts necessary for pipe layout and to install mechanical drainage lines.

Course Outcome(s):

Demonstrate the ability to install mechanical requirements for residential and commercial structures.

Objective(s):

1. Locate the work area and position the materials and tools required for mechanical installations using applied math calculations and code requirements.
2. Layout locations of respective PVC drainage lines using applied math and geometry.
3. Select proper hand/power tools and safely operate to perform installations.
4. Follow safety precautions as prescribed by OSHA and the PVC Pipe Association for personal safety and for other workers.

Methods of Evaluation:

1. Assignments
2. Participation
3. Exams
4. Attendance

Course Content Outline:

1. Identify (ID)Tools
1. Hand and power tools
   a. Hand
      i. Saws
      ii. Measuring
      iii. Levels
   b. Power
      i. Saws
      ii. Drills
      iii. layout
2. Basic vs. advanced tools
   a. Tool Selection
   b. Advanced applications
   c. Advantages vs. disadvantages
3. PVC Materials
   a. Schedules
      i. 80
      ii. 40
      iii. 30
   b. Applications
      i. Sewer/Building drainage
      ii. Strom drainage
      iii. Venting
      iv. Acid Waste
   c. Different fittings

        i. Ells
        ii. Wyes
        iii. Sanitary Tees
        iv. 45's
4. Different techniques to installing
    a. Cementing
    b. Welding
    c. Fusion
    d. Mechanical
5. Cementing vs. mechanical
    a. Advantages
        i. Easier to install
        ii. Cheaper price to install
    b. Disadvantages
        i. Joint cannot be reused
        ii. Chemical exposure
6. Cementing Process
    a. Straight cuts
    b. Clean surfaces
    c. Apply primer
    d. Apply cement
    e. Twisting of materials
    f. Set up time

1. Safety Procedures

1. Id Hazards
    a. Fires
    b. Abrasions
    c. Burns
    d. Chemical poisoning
    e. Confined spaces
2. Procedures for protection of worker(s)
    a. Pre task safety meetings
    b. Knowing the safety procedures of job site and employer
    c. Understanding OSHA regulations
3. PPE – ID and use
    a. Fire proof/heat resistance materials
    b. Proper body, foot and hand protection
    c. Eye and Face protection
4. Respiratory Ricks
    a. Understanding the air we breathe
    b. What is added to the air by soldering/brazing
    c. Chemical reactions to the body
    d. Protection from respiratory risks

1. Material, layout and locations
    a. Id drainage on drawings
        i. Code requirements
        ii. Interpret water and waste lines
        iii. Understanding what drawings to look at
    b. Differences between Civil, Mechanical drawings and schematics
        i. What is on these drawings
        ii. What is lacking on these drawings
        iii. Types of schematics
        iv. Schematic use in the installation process
    c. Determine locations of pipes
        i. Understanding floor plans
        ii. Using the correct revisions
        iii. Measurements from common locations
        iv. Understanding job Specifications
    d. Estimate quantities

   i. What is estimating
   ii. How to estimate from drawings and specifications
   iii. Common procedures
e. Making lists
   i. Tools
   ii. Safety
   iii. Equipment
   iv. Materials
f. Review of trade related math
   i. Types of Measurements
   ii. Geometry related to the installs
   iii. Using math for quick lay outs

1. Installations for Residential and Commercial
   a. Location, tools and materials required
      i. Locate area of installation
      ii. Stage tools required
      iii. Gather materials that are needed
      iv. Check PPE
   b. Layout Locations using math
      i. Use drawings to assist in layout
      ii. Demonstrate use of advanced math
      iii. Understanding the differences between the different application systems
   c. Selection of tools
      i. Follow proper use of hand and power tools
      ii. Select most effective tools
   d. Use of Proper safety equipment
      i. Follow proper PPE
      ii. Follow jobsite and employer safety regulations
      iii. Demonstrate safety for others

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: https://portal2.tri-c.edu/ReligiousAccommodation/ Religious Accommodation Form. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf

Weekly Schedule

	Topics
Week 1	Course overview; identification of hand and power tools
Week 2	Hand tools: saws, measuring tools, levels
Week 3	Power tools: saws, drills, layout tools
Week 4	Basic vs. advanced tools; tool selection; advantages and disadvantages
Week 5	PVC materials and pipe schedules (Schedule 30, 40, 80)
Week 6	PVC applications: sewer, storm drainage, venting, acid waste
Week 7	PVC fittings: ells, wyes, sanitary tees, 45s
Week 8	Installation techniques overview: cementing, welding, fusion, mechanical
Week 9	Cementing vs. mechanical connections: advantages and disadvantages

Week 10	PVC cementing process: cutting, cleaning, priming, cementing, set up
Week 11	Safety procedures: hazards, PPE, OSHA requirements
Week 12	Respiratory risks and chemical exposure; worker protection
Week 13	Reading drawings: drainage identification, codes, civil vs. mechanical
Week 14	Schematics, pipe locations, floor plans, specifications
Week 15	Estimating materials, tools, and equipment; trade-related math
Week 16	Residential and commercial installations; layout and safety review

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings
Instructor-provided materials

Resources for the Instructor

United Association Training Department. *Drainage*. Annapolis, MD: United Association, www.ua.org/training

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United Association Training Department. *Soldering and Brazing*. Annapolis, MD: United Association, www.ua.org/training

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Additional Resources for the Instructor
www.copper.org (https://catalog.tri-c.eduwww.copper.org)
www.ua.org (https://catalog.tri-c.eduwww.ua.org)
www.kpsec.freeuk.com/solder.htm (https://catalog.tri-c.eduwww.kpsec.freeuk.com/solder.htm)
www.brazing.com (https://catalog.tri-c.eduwww.brazing.com)

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