

# APPT 133: P-201 BEGINNING DRAWING & DESIGN

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2024
<b>Units:</b>	5
<b>Hours:</b>	36 lecture, 72 laboratory per quarter (108 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Plumbing Technology Apprenticeship Program.
<b>Advisory:</b>	Not open to students with credit in APPR 112.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	None
<b>Grade Type:</b>	Letter Grade (Request for Pass/No Pass)
<b>Repeatability:</b>	Not Repeatable

## Student Learning Outcomes

- A successful student will be able to identify conventional drafting tools.
- A successful student will be able to describe isometric drawings.
- A successful student will be able to identify common pipe symbols.

## Description

Drawing fundamentals to instruction in isometric drawing. Students learn the proper design and sizing of simple waste, water, and gas systems. In-depth study of water supply systems is also included. Students also learn to read and interpret simple residential building plans, designing and coordinating plumbing systems within the structure.

## Course Objectives

The student will be able to:

1. List the design criteria of drainage and domestic water supply systems, both outside and within the building
2. Properly design and size waste/vent, water, and gas systems for a typical residential or small commercial building
3. Identify and demonstrate the use of typical drawing tools
4. Interpret the various building plans used in residential
5. Produce working isometric drawings of waste water and gas systems for a residential or small commercial application

## Course Content

1. List the design criteria of drainage and domestic water supply systems, both outside and within the building
  - a. Principles of drainage system venting and various venting methods
  - b. Components of building drainage systems

- c. UPC Code requirements in reference to drain waste and vent systems
  - d. Characteristics of water
  - e. Potable water
  - f. UPC Code requirements in reference to cross connection control
  - g. Principals of water distribution systems
  - h. Water main and water service piping systems
2. Properly design and size waste/vent, water, and gas systems for a typical residential or small commercial building
    - a. Water service and building water distribution system design requirements
    - b. Drain waste and vent system design requirements
    - c. Calculating fixture units
    - d. Calculate building water distribution pipe sizing
    - e. Sizing of sanitary drainage and vent piping systems
    - f. Natural gas building distribution piping
    - g. Sizing of natural gas piping system
  3. Identify and demonstrate the use of typical drawing tools
    - a. Identification and use of common drafting tools
    - b. Pencil and lead types
    - c. Architect's scale
    - d. 30/60 and 45 degree drawing triangles
    - e. Comply with proper drafting protocol for lines and lettering
  4. Interpret the various building plans used in residential construction
    - a. Identify importance of location when creating a three-view drawing
    - b. Demonstrate the correct method for arranging plan and elevation view
    - c. Identify various piping symbols
    - d. Describe graphic symbols for pipe fittings and valves
    - e. Interpret technical drawings for proper installation of piping systems
    - f. Describe riser diagrams
    - g. Introduce isometric drawings
    - h. Rules for creating isometric drawings
      - i. Create isometric drawings
      - j. Describe building plans
      - k. Describe architectural specifications
        - l. Interpret building specifications
    - m. Identify and describe various plumbing symbols
    - n. Discuss features of shop drawings
      - o. Describe the creation of shop drawings
  5. Produce working isometric drawings of waste water and gas systems for a residential or small commercial application
    - a. Identify importance of location when creating a three-view drawing
    - b. Demonstrate the correct method for arranging plan and elevation view
    - c. Identify various piping symbols
    - d. Describe graphic symbols for pipe fittings and valves
    - e. Interpret technical drawings for proper installation of piping systems
    - f. Describe riser diagrams
    - g. Introduce isometric drawings

- h. Rules for creating isometric drawings
  - i. Create isometric drawings
  - j. Describe building plans
  - k. Describe architectural specifications
    - l. Interpret building specifications
- m. Identify and describe various plumbing symbols
  - n. Discuss features of shop drawings
  - o. Describe the creation of shop drawings
  - p. Describe adding detail to shop drawings
  - q. Discuss code sections for UPC chapter 6, water heaters
    - r. Describe the process of drawing a water sizing diagram
  - s. Interpret ADA requirements as appropriate for fixture installation
  - t. Create ADA compliant drawing for a water closet installation
  - u. Create storm drain system
  - v. Create interceptor for a commercial application

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

1. Readings from assigned textbooks
  - a. Uniform Plumbing Code book
  - b. Blueprints
  - c. Manufacturer's catalogs and websites
2. Writing assignments given in the laboratory
  - a. Create isometric drawings

## Discipline(s)

Plumbing

## Lab Content

Students will work individually on the design and drawing of a residential plumbing system.

## Special Facilities and/or Equipment

1. Laboratory with drawing tools.
2. 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

## 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.. Water Supply. 2004.

International Pipe Trades Joint Training Committee, Inc.. Drawing Interpretation and Plan Reading. 2015.

International Association of Plumbing and Mechanical Officials. Uniform Plumbing Code. 2015.

Although these textbooks are older than 5 years, they conform to national training standards and are considered seminal works in the discipline. We will adopt the next edition of each text, as it is published.