APPT 136: P-302 ADVANCED TRADE MATH FOR PLUMBERS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	7
Hours:	72 lecture, 36 laboratory per quarter (108 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 118.
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 successful student will be able to calculate pipe diagonals and derive pipe lengths.
- A successful student will be able to calculate elevation and grade.
- A successful student will be able to calculate rolling offsets.

Description

Extensive use of piping formulas to solve typical piping layout calculations. Students calculate compound offsets and accurately determine center to center and end to end piping measurements for plumbing systems.

Course Objectives

The student will be able to:

1. Demonstrate basic math skills using fractions, decimals, conversion tables, ratios, and compound measurements
2. Illustrate the use of engineering and architectural measurements
3. Calculate and lay-out a piping system using formulas, angles, symbols, and piping offsets

Course Content

1. Demonstrate basic math skills using fractions, decimals, conversion tables, ratios, and compound measurements
   a. Addition and subtraction
   b. Multiplication and division
   c. Whole numbers and fractions
   d. Decimal conversions
   e. Decimal operations
   f. Percent operations
2. Illustrate the use of engineering and architectural measurements
   a. Pythagorean theorem
   b. Application to piping problems
   c. Use of protractor
   d. Right angle operations
   e. Opposite angles
   f. Alternate and corresponding angles
   g. Areas and volumes
   h. Geometric shapes
   i. Setting up and solving equations
   j. Ratios and proportions
3. Calculate and lay-out a drainage piping system using formulas, angles, symbols, piping offsets
   a. Simple and compound offsets
   b. Mitered offsets
   c. Equal spread offsets
   d. Calculate grade and fall
   e. Using a pocket calculator to solve plumbing problems

Lab Content

Students will work individually and in teams on piping installations with emphasis on calculations for offsets and layout of sanitary waste and vent systems.

Special Facilities and/or Equipment

1. Personal protective equipment.
2. Laboratory with plumbing tools.
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. United Association Piping Handbook and Offset Formulas. 2000.

International Pipe Trades Joint Training Committee. United Association Pocket Reference Chart. 2008.

Smith, Lee. Mathematics for Plumbers and Pipefitters, 8th ed.. 2013.

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.

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

1. Readings from assigned textbook Mathematics for Plumbers and Pipefitters: Unit-3, Solving Formulas/Equations
    a. Section 1, exercises: Review of basic formulas
2. Writing assignments given in the laboratory
    a. Quizzes from math workbooks
    b. Detail calculations for a sanitary waste piping project

Discipline(s)

Plumbing