

APPT 145: SF 301 ADVANCED TRADE MATH FOR STEAMFITTERS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
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 Steamfitting & Pipefitting Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPR 121.
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 calculate equal spacing.
- A student will be able to calculate pipe diagonals and derive pipe lengths.
- A student will be able to determine allowance for threaded fittings.

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.

Course Objectives

The student will be able to:

1. Demonstrate basic math skills required in steamfitting, including 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. Meaning of percent
 - g. 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 piping system using formulas, angles, symbols, and piping offsets
 - a. Simple and compound offsets
 - b. Mitered offsets
 - c. Equal spread offsets
 - d. Pipe bending calculations
 - e. Using a pocket calculator to solve pipefitting problems

Lab Content

Students will work individually and in teams to practice piping installations with emphasis on calculations for offsets and layout.

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 software and hardware capable of accessing email, learning management system, and video conferencing; 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 are the most current books used when teaching this course. 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 tube bending project

Discipline(s)

Steamfitting