

# APPT 143: SF 201 STEAMFITTER CUTTING & WELDING

## Foothill College Course Outline of Record

Heading	Value
<b>Units:</b>	4.5
<b>Hours:</b>	30 lecture, 78 laboratory per quarter (108 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Steamfitting & Pipefitting Technology Apprenticeship Program.
<b>Advisory:</b>	Not open to students with credit in APPR 122.
<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 student will be able to demonstrate proper flame cutting techniques on steel plate and pipe.
- A student will be able to demonstrate the proper assembly of oxy-fuel equipment.
- A student will be able to describe electrodes and the fundamental operating characteristics of SMAW.

## Description

Instruction and practice in oxy-fuel cutting, oxy-fuel welding and arc welding of steel plate and pipe. Safety and accuracy in measuring, lay-out and torch handling is emphasized.

## Course Objectives

The student will be able to:

- Describe the basic theoretical principles associated with cutting and welding steel.
- Safely perform cutting and welding processes.
- Set-up and use oxy-fuel and arc welding equipment.
- Measure, lay-out, cut and weld steel plate and pipe for fabrication.

## Course Content

- Cutting and Welding Steel
  - Weld ability of metals
  - Welding processes and applications
  - Filler metal selection
  - Welding joint design
- Cutting and Welding Processes
  - Burn prevention
  - Eye, ear, and respiratory protection
  - Ventilation

- Electrical and fire protection
  - Equipment maintenance
- Set-up for Oxy-Fuel and Arc Welding
    - Equipment set-up and operation
    - Fuel gases
    - Cutting torch tips
    - Chemistry and physics of flame cutting
    - Oxy-fuel welding
    - Pipe cutting and layout
  - Measure, Lay-out and Cut Steel
    - Templates
    - Miters
    - Welding equipment set-up and operation
    - Arc welding of plate and pipe

## Lab Content

Students will practice individually and in teams on techniques for cutting and welding steel plate and pipe.

## Special Facilities and/or Equipment

- Personal protective equipment.
- Laboratory with cutting and welding tools.

## Method(s) of Evaluation

- 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

- Lecture
- Lab Assignment
- Group Discussion
- Demonstration

## Representative Text(s) and Other Materials

Jeffus, Larry. Welding Principles and Applications. 7th ed. Clifton Park, NY: Delmar Cengage Learning, 2012.

Frankland, Thomas W. Pipe Template Layout. New York, NY: Glencoe McGraw Hill, The Bruce Publishing Company, 2008.

Frankland, Thomas W. The Pipefitters and Pipe Welder's Handbook. New York, NY: Glencoe McGraw Hill, 2008.

International Pipe Trades Joint Training Committee. United Association Piping Handbook and Offset Formulas. Upper Marlboro, MD: United Association, 2000.

Frankland, Thomas W. Pipe Trades Pocket Manual. New York, NY: Glencoe McGraw Hill, 2008.

NOTE: Although one or more of these texts are older than the recommended 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**

A. Readings from assigned textbook Welding Principles and Applications

1. Chapter 2: Safety in Welding
2. Chapter 5: Shielded Metal Arc Equipment and Setup

B. Writing assignments given in the laboratory

1. Essays and exams on welding safety
2. Essay and exams on welding processes, applications and filler metal selection

## **Discipline(s)**

Plumbing