

APSM 136: SMQ-36 SERVICE BASICS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	2
Hours:	26 lecture, 14 laboratory per quarter (40 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Apprenticeship Program.
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 interpret HVAC equipment nameplate information.
- A successful student will be able to safely identify and operate line voltage HVAC equipment disconnect switches.

Description

This course addresses the knowledge and development of the basic skills necessary for a sheet metal worker to service a basic HVAC building system.

Course Objectives

The student will be able to:

- Practice common safety precautions in working with HVAC systems
- Demonstrate knowledge and understanding of basic electricity
- Demonstrate an understanding of basic properties of heat transfer and air
- Identify the components and sequence of operation of a gas furnace heating system
- Describe the installation, operation, and maintenance of air conditioning split systems
- Complete a split system or small package unit start-up with HVAC test equipment
- Identify basic equipment and system troubleshooting techniques

Course Content

- Practice common safety precautions in working with HVAC systems
 - Ergonomic concerns
 - Electrical safety
 - Lock-out/tag-out
- Demonstrate knowledge and understanding of basic electricity
 - Identify and wire basic low voltage control components and systems
 - Perform basic electrical test meter operation on line and low voltage HVAC applications

- Demonstrate an understanding of basic properties of heat transfer and air
 - Conduction
 - Convection
 - Radiation
- Identify the components and sequence of operation of a gas furnace heating system
 - Thermostat functions
 - Startup
- Describe the installation, operation, and maintenance of air conditioning split systems
 - Demonstrate an understanding of the basic refrigeration cycle
 - Identify common HVAC Refrigerants, safe applications, EPA Regulations
 - Copper braze and pressure test refrigerant line sets and tubing
- Complete a split system or small package unit start-up with HVAC test equipment
 - Gather manufacturers' instructions
 - Identify test equipment needed
 - Confirm measurements within tolerances
 - Documentation
- Identify basic equipment and system troubleshooting techniques
 - Observation and symptoms
 - Test in sequence

Lab Content

Students will work individually and in teams on fabrication of sheet metal products using sheet metal equipment:

- Demonstration and practice of safety precautions with electricity in HVAC systems
- Demonstration and practice of safety precautions with gas in HVAC systems
- Practice troubleshooting the sequence of operations in an HVAC equipment installation

Special Facilities and/or Equipment

- Laboratory with sheet metal tools
- Personal protective equipment

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

- Results of written quizzes and tests
- Shop participation
- Comprehensive written final examination
- Comprehensive final project
- Evaluation of progress by weekly assignment

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

- Discussion
- Laboratory instruction
- Demonstration

Representative Text(s) and Other Materials

International Training Institute. HVAC, International Training Institute for the Sheet Metal and Air Conditioning Industry (student manual). 2005.

This is the standard Sheet Metal textbook/workbook used for this course. Although it may not be within 5 years of the required published date, it is the most current book used when teaching this course.

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

A. Reading assignments:

1. Weekly reading assignments from text and outside sources (provided by instructor)

B. Writing assignments:

1. Prepare documentation for a split system HVAC project

Discipline(s)

Sheet Metal