

# APPR 184A: AIR CONDITIONING; COMMERCIAL SYSTEMS; HEATING (FOURTH-YEAR SERVICE)

## 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 Sheet Metal-Air Conditioning Service Mechanic Program.
<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 describe two common methods of refrigerant capacity control.
- A successful student will be able to identify commercial refrigeration system components, including filter dryers, solenoid valves, sight glasses, expansion valves.

## Description

Development of skills necessary for sheet metal workers to service air conditioning equipment with emphasis on air-cooled commercial systems, refrigerant line components, installation and commercial applications.

## Course Objectives

The student will be able to:

- Examine and explain the low and high side of mechanical design in air-cooled air conditioners for commercial systems.
- Demonstrate the removal, testing, adjusting and replacing of various condensers and valves.

## Course Content

- Examine and explain the low and high side of mechanical design in air-cooled air conditioners for commercial systems
  - Describe the basic refrigeration cycle
  - Air-cooled commercial systems
    - Hermetic units
    - Outdoor air-cooled condensing units
    - Commercial compressors
    - Air-cooled condensers
  - Water-cooled condensers
  - Water valves

- Commercial evaporators
- Commercial defrost systems
- Compressor protection devices
- Refrigerant line components
- Pressure regulating and flow control valves
- Commercial system application
  - Grocery
  - Walk-ins
- Demonstrate the removal, testing, adjusting and replacing of various condensers and valves
  - Components: Removing, replacing, testing, adjusting
    - Condensers
    - Compressors
    - Valves
  - Installing commercial systems
    - Condensers, evaporators, tubing

## Lab Content

- Disassembly and assembly of refrigeration system components
- Application of test instruments and other tools to commercial refrigeration systems and components
  - Piping tools
  - Refrigerant gauges
  - Refrigerant vacuum pump
  - Refrigerant tanks
  - Electrical Multimeter
  - Air property measuring devices as needed to determine proper refrigerant charge

## Special Facilities and/or Equipment

Laboratory equipped with air conditioning equipment.

## Method(s) of Evaluation

- Results of written quizzes and tests, and comprehensive written final examination
- Shop participation
- Assignments that may include outside readings, reports and worksheets
- Maintenance of a workbook of student's daily work activities

## Method(s) of Instruction

- Lecture
- Discussion
- Laboratory
- Demonstration

## Representative Text(s) and Other Materials

Whitman, B., B. Johnson, J. Tomczyk, and E. Silberstein. Refrigeration and Air Conditioning Technology. Delmar, Cengage Learning, 2009.

International Training Institute for the Sheet Metal and Air Conditioning Industry. Service Work Lab Manual. IDI Multimedia, 2009.

NOTE: These are the standard Sheet Metal textbook/workbooks used for this course. Although they may not be within 5 years of the required

published date, they are the most current books used when teaching this course.

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

A. An example of a reading assignment is to read Unit 29, "Troubleshooting and Typical Operating Conditions for Commercial Refrigeration"

B. An example of a written assignment is to write in detail the step-by-step operation of a specified commercial air conditioning system

## **Discipline(s)**

Air Conditioning, Refrigeration, Heating