

# APPT 134C: OSHA 30/ REFRIGERATION & ELECTRICITY

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	4.5
Hours:	54 lecture per quarter (54 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing/Steamfitting & Pipefitting Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPT 134B.
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 describe the safe use of common personal protective equipment.
- A successful student will be able to properly use and maintain various types of respirators.
- A successful student will be able to list control measures for the elimination and controls of hazards.
- A successful student will understand basic electrical theory and simple electrical circuits.
- A successful student will have a clear understanding of the operation and components of a refrigeration system.

## Description

Study of the requirements for emergency response to and handling of hazardous materials. Covers laws of chemical hazards, electrical hazards, personal protective equipment, confined spaces, monitoring equipment, and federal and Cal-OSHA standards for the construction industry. In addition, this course covers the theory of basic electricity and refrigeration concepts through the study of circuit analysts and physical properties.

## Course Objectives

The student will be able to:

1. Identify regulators and legislation governing hazardous waste operations and response
2. Describe the importance of occupational safety
3. Demonstrate practical application of OSHA standards

4. Understand the basic properties of both refrigeration and electrical circuits
5. Identify main components in both refrigeration and electrical systems
6. Understand the hazards of both refrigeration and electrical systems

## Course Content

1. Identify regulators and legislation governing hazardous waste operations and response
  - a. HAZWOPER regulations and standards
  - b. Responsibilities of federal regulators
  - c. Code of Federal Regulations
  - d. Roles of OSHA, EPA, and DOT
  - e. Emergency response
2. Describe the importance of occupational safety
  - a. Six categories of toxic hazards
  - b. Personal protective equipment
  - c. Fall protection
  - d. Respiratory hazards
  - e. Confined space entry
  - f. Hazard communication—MSDS
  - g. Lockout tag out
3. Demonstrate practical application of OSHA standards
  - a. OSHA 30
4. Describe electrical principals and electrical components
  - a. Electrical circuit current, voltage, amps, Ohm's Law
  - b. Wiring diagrams, components, and symbols
  - c. Schematic and ladder diagrams
  - d. Electrical troubleshooting and safety
  - e. Basic refrigeration cycle
  - f. The British thermal unit (BTU)
  - g. Sensible and latent heat
  - h. Vapor compression cycle
    - i. Basic refrigeration cycle and system components, including compressor, condenser, evaporator, and metering device
    - j. Refrigerant piping and accessories

## Lab Content

Not applicable.

## Special Facilities and/or Equipment

1. 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  
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  
Assignments  
Demonstration  
Group discussion

## Representative Text(s) and Other Materials

CAL/OSHA. CAL/OSHA Pocket Guide For The Construction Industry. 2015.

CAL/OSHA. State of California Construction & Electrical Safety Orders. 2016.

Mancomm, Inc.. 29 CFR - 1926 OSHA Construction Industry Regulations & Standards. 2017.

De Mark, Larry. Signal Person Training Course Version 4 with Student Guide. 2012.

Carrier Corporation. General Training Air Conditioning (Fundamentals) GTAC-I, Modules 1-4. 1993.

Carrier Corporation. General Training Electricity (Fundamentals) GTE-II, Modules 1-3. 1993.

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 textbooks
  - a. CAL/OSHA Pocket Guide safety regulation lessons
  - b. General Training Air Conditioning (Fundamentals)
2. Writing assignments
  - a. Essay and exams on the importance of safety rules and regulations governing construction
3. Make a schematic of a basic refrigeration system with required components
  - a. Essay describing the refrigeration cycle and the properties of each point in the system

## Discipline(s)

Steamfitting