

# APPT 173: BASIC ELECTRICITY FOR THE HVAC SERVICE TRADE

## Foothill College Course Outline of Record

Heading	Value
<b>Units:</b>	4
<b>Hours:</b>	24 lecture, 75 laboratory per quarter (99 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Refrigeration & Air Conditioning Mechanical Service Apprenticeship 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 student will be able to demonstrate basic electrical theories.
- A student will be able to apply Ohm's law.
- A student will be able to use simulators and apply D.C. power and A. C. power.

## Description

Provides students with a working knowledge of basic electricity, including AC/DC theory and Ohm's Law. Students will be expected to apply these theories in the laboratory using electronic and testing instruments.

## Course Objectives

The student will be able to:

- Demonstrate basic electrical theories
- Explain Ohm's Law
- Explain DC and AC power

## Course Content

- Basic Electricity
  - Electrical Theory
  - Volts, Current, Resistance
- Ohm's Law
  - $E = I \times R$
- DC and AC Power for HVAC Systems
  - Direct Current Circuitry
  - Alternating Current Circuitry
  - Electronics

## Lab Content

Students will work individually and in teams with electrical and testing tools and demonstrate basic electrical theories in the lab, which includes:

- Study of AC & DC theory
- Principles of Thermodynamics # 1 related to refrigeration Enthalpy

- Electrical safety practices

## Special Facilities and/or Equipment

- Laboratory with electrical and testing tools
- Personal protective equipment

## Method(s) of Evaluation

- Written examination
- Hands-on demonstration
- Chapter quizzes
- Group and classroom participation

## Method(s) of Instruction

- Lecture
- Discussion
- Laboratory
- Demonstration

## Representative Text(s) and Other Materials

United Association of Journeymen and Apprentices. [Electrical Controls for Mechanical Equipment Service](#). Washington, D.C.: International Pipe Trades Joint Training Committee, Inc., 2015.

Meyer, Leo A. [Basics of Electricity](#). Hayward, CA: Lama Books, 2009.

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

- Readings from the textbooks

- Application of Ohm's Law to a DC circuit
- Review NFPA 99c to be in compliance with fire protection and/or circuit protection code

- Read Chapter 1: Switch Action, Rheostat, and Potentiometer and complete assignment at the end of the chapter

- Writing assignments are related to the assignments given in the laboratory

- Calculations Ohm's Law to AC circuitry
- Calculating load to motor control circuits
- Lab assignments at the end of each chapter of the textbook
- Complete writing assignment for Two Stage Cooling Thermostat

## Discipline(s)

Air Conditioning, Refrigeration, Heating