

APPT 174: ELECTRICAL TECHNOLOGIES II

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	4.5
Hours:	36 lecture, 66 laboratory per quarter (102 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Refrigeration & Air Conditioning Mechanical Service Apprenticeship Program.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

Student Learning Outcomes

- A student will be able to apply circuitry.
- A student will be able to apply electronics.
- A student will be able to demonstrate variable frequency drives.
- A student will be able to identify, recognize and classify motors and starters.

Description

Second-year course of the Refrigeration and Air Conditioning Apprenticeship program. This course provides students with a working knowledge of advanced electricity, motors, starter, circuitry, and variable drives.

Course Objectives

The student will be able to:

1. Recognize, classify, and explain motors and starters
2. Recognize, classify, and explain circuitry
3. Recognize, classify, and explain electronics
4. Recognize variable frequency drives

Course Content

1. Motors and starters
 - a. Electricity for motors and starters
 - b. Circuit protection
2. Circuitry
 - a. Solid state and digital
 - b. Protection devices
3. Electronics
 - a. Advanced PDC
 - b. Electronic test equipment
4. Variable frequency drives

- a. Frequency controlled circuits
- b. Advanced circuitry

Lab Content

Students will work individually and in teams on electrical wiring for refrigeration systems in the lab, which includes:

1. Using a voltmeter, ohmmeter, and ammeter
2. Advanced Electronics I: Motors and Starters
3. Troubleshooting circuits
4. Open and inspect teardown
 - a. Carrier 5H series compressor

Special Facilities and/or Equipment

1. Laboratory with electrical tools/testers
2. Personal protective equipment
3. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address

Method(s) of Evaluation

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

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

Method(s) of Instruction

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

Lecture
 Discussion
 Laboratory
 Demonstration

Representative Text(s) and Other Materials

United Association of Journeymen and Apprentices. [Electric Controls for Mechanical Equipment Service](#). 2020.

U.A.. [Basic Electricity](#). 2019.

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

1. Readings from the textbook
 - a. Application of variable frequency devices (VFDs) and direct digital control devices (DDCs)
 - b. Solar cooling controls and its operating principles
 - c. Creating advanced schematics
2. Writing assignments are related to the assignments given in the laboratory

- a. Students write about the classification of motors, starters, electronic devices in refrigeration equipment and variable frequency drives
- b. Students prepare a complete pneumatic/electrical wire diagram for an air conditioning circuit

Discipline(s)

Air Conditioning, Refrigeration, Heating