APPT 196: BASIC ELECTRICITY, ELECTRICAL CONTROLS FOR MECHANIC EQUIPMENT

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting 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 student will be able to describe the operation of a basic air conditioning system.
- A student will be able to demonstrate tube-bending procedures.

Description

Students will be taught basic electrical principals relating to mechanical equipment. Ohm's Law, circuitry, variable frequency drives, as well as troubleshooting techniques will be covered. Students will be able to identify and classify motors and starters.

Course Objectives

The student will be able to:
A. Describe basic electrical fundamentals, including Ohm's Law and basic circuit types
B. List and explain the function of various electrical devices and components
C. Demonstrate the proper use of meters and simple components
D. Recognize, classify, and explain motors and starters
E. Recognize, classify, and explain circuitry
F. Recognize variable frequency drives

Course Content

A. Fundamentals of electricity
1. Atomic theory
2. Ohm's Law
3. Power distribution
B. Electrical safety
1. Effects of human contact with electricity
2. Lock-out/tag-out procedures
C. Measuring instruments
1. Digital and analog types
2. Voltmeter
3. Ammeter
4. Ohmmeter
D. Motors and starters
1. Electrical motor types
2. Motor starters
3. Overload protection
4. Troubleshooting
E. Electrical circuits
1. Capacitive, inductive, and resistive loads
2. Series, parallel, and compound circuits
3. Fuses, breakers, and conductors
F. Variable frequency drives
1. Frequency controlled circuits
2. Advanced circuitry

Lab Content

Students will work individually and in teams to create, test and troubleshoot simple electrical circuits using devices and tools typically found in the plumbing and pipefitting industry.

Special Facilities and/or Equipment

A. Laboratory with electrical tools/testers
B. Personal protective equipment

Method(s) of Evaluation

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

Written examinations
Hands-on demonstrations
Chapter quizzes
Group and classroom participation
Maintenance of a student workbook with questions drawn from text

Method(s) of Instruction

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

Lecture
Lab assignment
Group discussion
Demonstration

Representative Text(s) and Other Materials

International Pipetrades Joint Training Committee, Inc.. Basic Electricity. 2015.

International Pipetrades Joint Training Committee, Inc.. Electrical Controls for Mechanical Equipment Service. 2006.

While one or more of the required texts may be more than five years old, they are standard texts in the industry and are the most current available edition(s).

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

A. Reading from textbooks:
1. Application of Variable Frequency Devices (VFDs) and Direct Digital Control Devices (DDCs)
2. Creating advanced schematics
B. Writing assignments given in the laboratory
1. Students write about the classification of motors, starters, electronic devices, and variable frequency drives

Discipline(s)

Plumbing