

# APPT 175: CONTROLS I/ ELECTRO PNEUMATICS

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	4.5
Hours:	36 lecture, 63 laboratory per quarter (99 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 identify electric/pneumatic controls.

## Description

Third-year course of the Refrigeration and Air Conditioning Apprenticeship program. This course provides students with a working knowledge of controls, control theory, timing circuits, computerized control, and energy management systems.

## Course Objectives

The student will be able to:

- Explain control theories
- Recognize and classify electric/pneumatic controls
- Recognize and explain energy management systems

## Course Content

- Controls theory
  - Electric controls
    - 2-position
    - Timed 2-position
    - Floating
    - Modulation
- Electric/pneumatic controls
  - DDC
  - Computerized control
- Energy management systems
  - Title 24 compliance
  - Energy efficiency

## Lab Content

Students will work individually and in teams on pneumatic controls, timing circuits and building air handling systems in the lab, which includes:

- Installation practices with tubing, tubing sizing, control tube soldering and tube bending
- Termination, fitting identification, control identification and tool identification
- Troubleshooting process for pneumatic controls

## Special Facilities and/or Equipment

- Laboratory with pneumatic electrical tools
- Personal protective equipment
- 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

. [Introduction to Building Control Systems](#). 2014.

Texts older than five years that may be utilized in this course are industry-standard texts and are the most recent publication date.

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

- Readings from the course textbook, [Introduction to Building Control Systems](#)
  - Section on safety
  - Recognize, maintain, operate and troubleshoot pneumatic control systems
- Writing assignments are related to the assignments given in the laboratory and include:
  - Writing an article on energy efficiency, Title 24, as it pertains to the plumbing industry
  - Developing a timing circuit, air handling circuit and electronic diagram as part of the mid-term

- iii. Handouts on sizing calculations for compressors and air dryers
- iv. Assignments on the use of thermostats

## **Discipline(s)**

Air Conditioning, Refrigeration, Heating