

APPT 176: DIRECT DIGITAL CONTROLS 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 calibrate and apply building management systems.
- A student will be able to apply fiber optics and D.D.C. controls.

Description

Third year of the Refrigeration and Air Conditioning Apprenticeship program. This course provides students with a working knowledge of advanced control systems, including the uses of 2-position, floating, and modulating controls. Fiber optics and direct digital controls are introduced.

Course Objectives

The student will be able to:

1. Recognize and classify pneumatic controls
2. Recognize fiber optics and DDC controls
3. Calibrate control systems to the building design

Course Content

1. Controls
 - a. 2-position
 - b. Floating
 - c. Modulating
2. Fiber optics and DDC controls
 - a. Introduction to fiber optics
 - b. Wiring for direct digital control
3. Calibrate control systems
 - a. Temperature control
 - b. Calibration
 - c. Hydronics

Lab Content

Students will work individually and in teams on setup and calibration of pneumatic control systems in the lab, which includes:

1. Properties of DDC systems
2. Components used in a typical system
3. Digital inputs and outputs
4. Cables used in industry
5. Software products used in industry

Special Facilities and/or Equipment

1. Laboratory with calibration tools
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. [Introduction to Building Control Systems](#). 2014.

Texts older than five years that may be utilized in this course are industry-standard texts; the most recently-published text is utilized.

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

1. Readings from the textbook
 - a. History of DDC control systems
 - b. The application of fiber optics and fiber optic circuits
 - c. The application of transducers used in circuits
2. Writing assignments are related to the assignments given in the laboratory and include:
 - a. Preparation of an advanced pneumatic calibration circuit with wiring diagrams
 - b. Assignments on hardware components that are used in a typical system

- c. Assignments on software components that are used in a typical system

Discipline(s)

Air Conditioning, Refrigeration, Heating