APPT 176: CONTROLS II/ ADVANCED PNEUMATICS CALIBRATION/HYDRONICS

Foothill College Course Outline of Record

Heading	Value
Units:	4.5
Hours:	30 lecture, 72 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 (Request for Pass/No Pass)
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 & 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:
A. Recognize and classify pneumatic controls
B. Recognize fiber optics and D.D.C. Controls
C. Calibrate control systems to the building design

Course Content

A. Pneumatic Controls
1. 2-position
2. Floating
3. Modulating
B. Fiber Optics and D.D.C. Controls
1. Introduction to fiber optics
2. Wiring for direct digital control
C. Calibrate Control Systems
1. Temperature control
2. Pneumatics & calibration
3. Hydronics

Lab Content

Students will work individually and in teams on setup and calibration of pneumatic control systems in the lab, which includes:
A. Properties of DDC systems
B. Components used in a typical system
C. Digital inputs and outputs
D. Cables used In industry
E. Software products used in industry

Special Facilities and/or Equipment

A. Laboratory with calibration tools
B. Personal protective equipment

Method(s) of Evaluation

A. Written examination
B. Hands-on demonstration
C. Chapter Quizzes
D. Group and Classroom participation
E. Punctuality

Method(s) of Instruction

A. Lecture
B. Discussion
C. Laboratory
D. Demonstration

Representative Text(s) and Other Materials

United Association of Journeymen and Apprentices. Hydronics Heating and Cooling. Washington, D.C.: International Pipe Trades Joint Training Committee, Inc., 2016.

United Association of Journeymen and Apprentices. Building Control Systems. Washington, D.C.: International Pipe Trades Joint Training Committee, Inc., 2008.

Texts older than 5 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

A. Readings from the textbooks

1. History of DDC control systems

2. The application of Fiber Optics and Fiber Optic circuits

3. The application of transducers used in circuits

B. Writing assignments are related to the assignments given in the laboratory and include:

1. Preparation of an advanced pneumatic calibration circuit with wiring diagrams

2. Assignments on hardware components that are used in a typical system

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

Discipline(s)

Air Conditioning, Refrigeration, Heating