APPT 147A: SF 401A HYDRONIC SYSTEMS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	3.5
Hours:	36 lecture, 18 laboratory per quarter (54 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Steamfitting & Pipefitting Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPR 125.
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 define the purpose of the mono-flow fitting.
- a student will be able to describe centrifugal pumps.
- A student will be able to describe operation of the relief valve.

Description

Basic principles of various hydronic systems, including equipment selection, pipe sizing, piping connections, and proper installation methods. Start, test, and balance procedures.

Course Objectives

The student will be able to:

1. Describe principles of hydronic heating
2. Identify types of hydronic heating systems
3. Identify the appropriate equipment and pipe sizing for hydronic system
4. Describe the installation of equipment used in a hydronic system
5. Describe the start, test, and balance procedures for hydronic systems

Course Content

1. Describe principles of hydronic heating
   a. Advantages of hydronic heating
   b. Gravity circulation
   c. Forced circulation
2. Identify types of hydronic heating systems
   a. Series loop
   b. One-pipe
   c. Two-pipe
3. Identify the appropriate equipment and pipe sizing for hydronic systems
   a. Equipment layout for hydronic systems
   b. Pipe sizing for hydronic systems
   c. Compression tank sizing
   d. Air separator sizing
   e. Triple duty valves
   f. Suction diffusers
4. Describe the installation of equipment used in a hydronic system
   a. Pump installation techniques
   b. Compression tank installation
   c. Installation process of air separators
   d. Make-up water line installation
5. Describe the start, test, and balance procedures for hydronic systems
   a. Water balance procedures
   b. Identify automatic controls
   c. Testing and inspecting equipment in an installed hydronic system

Lab Content

Students will work individually and in teams on piping systems with emphasis on hydronic principals.

Special Facilities and/or Equipment

1. Laboratory with hydronics equipment
2. When taught via Foothill Global Access, on-going access to computer with software and hardware capable of accessing email, learning management system, and video conferencing; email address

Method(s) of Evaluation

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

Results of written exercises and final examination
Satisfactory completion of hands-on projects
Maintenance of a student's workbook with questions drawn from text
Group and classroom participation

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 Pipe Trades Joint Training Committee, Inc.. Hydronic Heating and Cooling for United Association Journeyworkers & Apprentices. 2015.

Although this textbook is older than 5 years, it conforms to national training standards and is considered seminal in the discipline. We will adopt the next edition, as it is published.

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

1. Readings from assigned textbook Hydronic Heating and Cooling
   a. Articles and lessons in Chapter 3: Equipment Selection and Pipe Sizing
   b. Articles in Chapter 2: Principals of Hydronic Heating, and essay questions
2. Writing assignments given in the laboratory
   a. Sketch a schematic drawing of a basic hydronic heating system
   b. Essay describing the properties of each component in the system

Discipline(s)

Steamfitting