Course Information

Division: Industrial Technology Education
Course Number: IPT 130
Title: Industrial Valve Maintenance and Repair
Credits: 3
Developed by: M. Crockett/Revised by Frank Martinez
Lecture/Lab Ratio: 1 Lecture/4 Lab
Transfer Status: Pending evaluation
Activity Course: No
CIP Code: 47.0303
Assessment Mode: Pre/Post Test (35 Questions/35 Points)
Semester Taught: Fall
GE category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
None

Educational Value
A. To general education: None
B. To other courses or curricula: This course is a curriculum requirement for the Industrial Plant Technician certificate.

Description
This course covers various types of valves and their associated piping systems as applied in industrial settings.

Supplies
None
Competencies and Performance Standards

1. Identify various valve types

   Learning Objectives
   What you will learn as you master the competency:
   a. identify globe valves
   b. identify butterfly valves
   c. identify wafer valves
   d. identify weir valves
   e. identify needle valves
   f. identify ball valves

   Performance Standards
   Competence will be demonstrated:
   • in class discussion
   • group practice
   • using model valves
   • on written tests
   Performance will be satisfactory when:
   • learner completes written test to 70% correct
   • learner correctly identifies model valve types

2. Use proper nomenclature for various valve parts

   Learning Objectives
   What you will learn as you master the competency:
   a. identify stem
   b. identify actuator yoke
   c. identify packing box
   d. identify bonnet
   e. identify cage
   f. identify seat ring
   g. identify plug
   h. identify body
   i. identify gaskets

   Performance Standards
   Competence will be demonstrated:
   • in class discussion
   • group practice
   • using model valves
   • on written tests
   Performance will be satisfactory when:
   • learner completes written test to 70% correct
   • learner correctly identifies model valve parts
3. **Understand the principles of valve operation**

   **Learning Objectives**
   What you will learn as you master the competency:
   a. use correct nomenclature for valve parts
   b. explain hand, air, and hydraulic operational methods

   **Performance Standards**
   Competence will be demonstrated:
   - in class discussion
   - group practice
   - using model valves
   - on written tests
   Performance will be satisfactory when:
   - learner completes written test to 70% correct
   - learner correctly identifies model valve parts

4. **Explain the characteristics of flow in different valves**

   **Learning Objectives**
   What you will learn as you master the competency:
   a. define laminar flow
   b. define turbulent flow
   c. define mixed flow
   d. correctly apply these characteristics to specific valve types
   e. explain pressure drops

   **Performance Standards**
   Competence will be demonstrated:
   - in class discussion
   - group and individual practice
   - on calculation problems
   - using model pumps
   - written tests
   Performance will be satisfactory when:
   - learner completes written test to 70% correct
   - learner completes accurate calculations of given pump systems

5. **Apply principles of proper valve selection for specific applications**

   **Learning Objectives**
   What you will learn as you master the competency:
   a. determine fluid types
   b. determine temperatures
   c. determine viscosity
d. determine specific gravity  

e. determine capacity of flow  

f. determine system pressure  

g. determine pressure drops  

h. apply these principles to select the proper valves for given applications  

Performance Standards  

Competence will be demonstrated:  
• in class discussion  
• using model valves  
• individual demonstrations  
• written tests  

Performance will be satisfactory when:  
• learner completes written test to 70% correct  
• learner selects the proper valves for given applications  

6. Use safe and efficient valve maintenance procedures  

Learning Objectives  

What you will learn as you master the competency:  

a. disassemble a valve  

b. inspect and evaluate valve parts  

c. reassemble the valve  

d. employ proper valve maintenance procedures  

Performance Standards  

Competence will be demonstrated:  
• in class discussion  
• using model valves  
• individual demonstrations  
• written tests  

Performance will be satisfactory when:  
• learner completes written test to 70% correct  
• learner successfully completes takedown, inspection, and reassembly task  
• learner demonstrates safe and proper maintenance procedures for various types of valves  

7. Develop valve troubleshooting skills  

Learning Objectives  

What you will learn as you master the competency:  

a. infer and apply troubleshooting strategies  

b. use test equipment appropriately  

c. use safe practices for troubleshooting valves  

Performance Standards
Competence will be demonstrated:
- in class discussion
- in group practice
- in "bugged" valve systems

Performance will be satisfactory when:
- learner identifies and corrects system problems
- learner uses safe practices

Types of Instruction
Lecture/modeling
Lab assignments
Group practice
Individual projects

Grading Information
Assignments
Labs—50%
Written tests—50%

Grading Scale
A=90-100%
B=80-89%
C=70-79%
D=60-69%
F=0-59%