Industrial Plant Hydraulics
Course Design
2006-2007

Course Information
Organization Eastern Arizona College
Division Industrial Technology Education
Course Number IPT 150
Title Industrial Plant Hydraulics
Credits 2
Developed by Mike Crockett
Lecture/Lab Ratio 1 Lecture/2 Lab
Transfer Status Pending Evaluation - Recommended: CTE/DEC to NAU
Activity Course No
CIP Code 47.0303
Assessment Mode Pre/Post Test (25 Questions/50 Points)
Semester Taught Spring
GE Category None
Separate Lab No
Awareness Course No
Intensive Writing Course No

Prerequisites
TEC 112 with a grade of "C" or higher

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 reviews fluid mechanics in an industrial setting, as applied to the operation, maintenance, and repair of specific industrial equipment.

Supplies
None
Competencies and Performance Standards

1. Understand principles of hydraulics

   Learning objectives
   What you will learn as you master the competency:
   a. identify the components of typical hydraulic systems
   b. analyze a hydraulic schematic drawing
   c. analyze examples of common industrial applications of hydraulics
   d. evaluate examples of common industrial applications of hydraulics

   Performance Standards
   Competence will be demonstrated:
   o in class discussion
   o in labeling and drawing hydraulic schematic diagrams
   o on model hydraulic systems
   Performance will be satisfactory when:
   o learner correctly identifies the components of a typical hydraulic system
   o learner completes written test to 70% correct
   o learner analyzes examples of hydraulic applications
   o learner evaluates examples of hydraulic applications
   o learner submits written report of analysis and evaluation

2. Practice hydraulic 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 hydraulic systems

   Performance Standards
   Competence will be demonstrated:
   o in “bugged” systems
   o in schematic diagrams
   Performance will be satisfactory when:
   o learner identifies and corrects system problems
   o learner uses safe practices

3. Install and maintain tubing and hose systems

   What you will learn as you master the competency:
   a. design a basic hydraulic system
   b. fit and install components in rigid tubing systems
   c. fit and install components in flexible hose systems
   d. maintain system components
   e. use safe practices
Performance Standards

Competence will be demonstrated:
- in schematic diagrams
- in group projects

Performance will be satisfactory when:
- learner completes project to working specification
- learner demonstrates proper maintenance procedures
- learner uses safe practices

4. Install and maintain valves and piping system protection

What you will learn as you master the competency:
- determine best type of valve for specific application
- fit and install valves in rigid tubing systems
- determine need for piping system protection
- list types of piping system protection
- use safe practices

Performance Standards

Competence will be demonstrated:
- in schematic diagrams
- in group projects

Performance will be satisfactory when:
- learner completes project to working specification
- learner demonstrates proper maintenance procedures
- learner uses safe practices

5. Perform hydraulics calculations

Learning Objectives

What you will learn as you master the competency:
- perform force calculations
- compute piston area
- determine pipe size requirements
- calculate horsepower and torque
- calculate velocity and flow
- design a simple hydraulics system

Performance Standards

Competence will be demonstrated:
- in class discussion
- group practice
- individual designs
- written tests
Performance will be satisfactory when:
- learner completes written test to 70% correct
- learner submits acceptable hydraulics design

6. Locate resources for hydraulics maintenance and repair

Learning Objectives
What you will learn as you master the competency:
- use reference texts
- use equipment manuals

Performance Standards
Competence will be demonstrated:
- in class discussion
- using sample resources
- in group practice
- on written test

Performance will be satisfactory when:
- learner successfully locates needed resources
- learner completes written test to 70% correct

7. Apply hydraulics knowledge to specific maintenance and repair tasks

Learning Objectives
What you will learn as you master the competency:
- become familiar with the maintenance requirements of specific industrial machines
- perform routine maintenance tasks on specific industrial machines
- perform hydraulics repair on specific industrial machines

Performance Standards
Competence will be demonstrated:
- in class discussion
- using model systems
- group projects
- individual demonstrations

Performance will be satisfactory when:
- learner successfully completes maintenance and repair tasks
- learner submits written report of work accomplished

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

Assignments
Labs—50%
Written reports and tests—50%

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