

Minnesota State College Southeast

MECH 1710: Introduction to Hydraulics & Pneumatics

A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: 1

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites:

This course requires the following prerequisite

MECH 1610 - Basic Industrial Controls

Corequisites: None

MnTC Goals: None

This course introduces students to industrial hydraulic and pneumatic systems. Students will complete labs where they identify and utilize basic components. Students will assemble and troubleshoot fluid power systems up to and including electrical control. Prerequisite: MECH1610 (2 Credits: 1 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 01/13/2020 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Principals of Fluid Pressure and Flow
2. Basic Fluid Power Circuits
3. Fluid Power Schematics
4. Fluid Power Speed Control Circuits
5. Electrical Control of Fluid Power Circuits

D. LEARNING OUTCOMES (General)

1. Identify hydraulic fluid characteristics
2. Identify various hydraulic system components
3. Explain hydraulic terms
4. Examine various hydraulic pump types
5. Examine various hydraulic system pressure controls
6. Analyze velocity and flow rate relationship
7. Analyze pressure, area, force relationships
8. Examine Pascal's Law
9. Examine pump cavitation
10. Explain fluid force transmission
11. Identify fluid power physical concepts
12. Analyze fluid power system designs
13. Examine fluid power component sequencing controls
14. Examine various hydraulic and pneumatic actuators
15. Examine hydraulic and pneumatic accumulator operation
16. Examine fluid power control valve operation
17. Explain fluid power motor operation
18. Interpret hydraulic system schematic symbols
19. Explain fluid power maintenance considerations
20. Apply basic electrical control to a fluid power system
21. Apply relay control to a fluid power system
22. Create timer-controlled fluid power systems
23. Identify pneumatic system safety precautions
24. Identify hydraulic system safety precautions
25. Demonstrate safety

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted