

Minnesota State College Southeast

INDS 1622: Introduction to Hydraulics & Pneumatics

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course provides an introduction to fluid power technology using liquids or compressed air. An emphasis will be placed on the practical application of the physical laws that govern hydraulics and pneumatics. Students will develop an understanding of the components of hydraulic and pneumatic systems including, but not limited to, pumps, pressure regulators, valves, and safety concerns. (Prerequisite: None) (3 credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 09/23/1998 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Physical Properties of Fluid
2. Applied Fluid Physics
3. Common Hydraulic and Pneumatic Equipment
4. Systems and Schematics

D. LEARNING OUTCOMES (General)

1. Identify hydraulic fluid characteristics
2. Examine closed center hydraulic systems
3. Explain hydraulic terms
4. Examine various hydraulic system pressure controls
5. Identify various hydraulic system components
6. Explain various hydraulic pump operations
7. Examine various hydraulic pump types
8. Demonstrate safety
9. Examine various hydraulic system applications
10. Analyze velocity and flow rate relationship
11. Analyze pressure, area, force relationships
12. Analyze pressure types
13. Examine Pascal's Law
14. Explain pneumatic force transmission
15. Explain hydraulic force transmission
16. Identify pneumatic physical concepts
17. Identify hydraulic physical concepts
18. Manipulate hydraulic formulas
19. Discuss fire resistant hydraulic fluid characteristics
20. Interpret hydraulic system schematic symbols
21. Examine check valve operation
22. Examine pump cavitation
23. Analyze various pneumatic system designs
24. Analyze various hydraulic system designs
25. Examine hydraulic component sequencing controls
26. Apply Pascal's Law
27. Examine open centered hydraulic systems
28. List contamination sources
29. Examine various pneumatic system applications
30. Explain hydraulic motor operation
31. Examine hydraulic system reservoirs
32. Examine hydraulic control valve operation
33. Examine hydraulic accumulator operation
34. Identify pneumatic system safety precautions
35. Identify hydraulic system safety precautions
36. Explain pneumatic system maintenance considerations
37. Explain hydraulic system maintenance considerations
38. Examine various hydraulic and pneumatic actuators
39. Examine various hydraulic system filter types

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted