Faculty are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Collegewide Curriculum Committee.

DEPT. Fluid Power  COURSE NO. FLPW 1100

NUMBER OF CREDITS: 4

COURSE TITLE: Fluid Power Hydraulic Theory

CATALOG DESCRIPTION: Introduction to basic hydraulic concepts, formulas, and applications of hydraulic components used for directional, flow and pressure control of circuits. Also provides students with the knowledge and understanding of the operation, function, and application of hydraulic pumps, continuous rotation motors, and limited rotation motors.

AUDIENCE

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

LENGTH OF COURSE 4 Credits (4 lect/pres, 0 lab, 0 other)

THIS COURSE IS USUALLY OFFERED:
Every other year [ ] fall  X  spring  [ ] summer  [ ] undetermined  [ ]

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADEMIC CONTENT: The student will receive the knowledge to understand basic Fluid Power concepts and components.

2) THINKING SKILLS: The student will be able to design basic hydraulic circuits.

3) COMMUNICATIONS SKILLS: The student will begin to demonstrate appropriate communications both oral and written.

4) HUMAN DIVERSITY: The student will gain self awareness regarding their feelings towards people of different cultures, value systems and socioeconomic status.

TOPICS TO BE COVERED:

1. define fluid power
2. list fluid power advantages/disadvantages
3. describe other energy transmission systems
4. describe fluid power terms
5. describe Pascal's Law
6. describe effects of pressure/pressure drop
7. describe characteristics of fluid flow
8. describe energy conservation theory
9. draw symbols used in fluid power
10. describe/design check valve operation & circuits
11. describe shutoff valve operation/ characteristics
12. describe pilot operated check valve operation
13. describe 2-way, 3-way, four-way valve operation
14. describe two stage valve operation
15. list valve selection factors
16. describe relief, sequence, unloading, load control valve & pressure reducing valve characteristics / symbols
17. describe non-compensated & compensated flow controls
18. describe flow control types
19. design meter-in/meter-out flow control circuits
20. describe flow dividers
21. design deceleration valve circuits
22. identify non-positive/positive displacement pump types
23. describe hydraulic pump efficiencies
24. identify gear/vane/piston pump characteristics
25. describe pressure compensated pump operation
26. identify various hydraulic pump circuits
27. list hydraulic motor performance parameters
28. identify various hydraulic motor types characteristics
29. identify basic hydraulic motor circuits
30. identify various hydraulic cylinder types characteristics
31. list hydraulic cylinder parts/options
32. list hydraulic cylinders selection factors
33. identify basic cylinder circuits

LIST OF EXPECTED COURSE OUTCOMES: The student will understand basic fluid power concepts and components and be able to design circuits with these components.

LEARNING/TEACHING TECHNIQUES used in the course are:
X[C] Collaborative Learning    X[C] Problem Solving
[ ] Student Presentations    [ ] Interactive Lectures
[ ] Creative Projects    [ ] Individual Coaching
X[C] Lecture    [ ] Films/Videos/Slides
X[C] Demonstrations    [ ] Other (describe below)
[ ] Lab
ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- X Reading
- X Tests
- X Individual Projects
- □ Oral Presentations
- □ Collaborative Projects
- X Textbook Problems
- □ Papers
- □ Portfolio
- □ Group Problems
- □ Term Paper
- □ Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:

The information in this course outline is subject to revision

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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