DEPT. Fluid Power Technology       COURSE NO. FLPW1125

NUMBER OF CREDITS: 2

COURSE TITLE: Industrial Electro-Mechanical Control Theory

CATALOG DESCRIPTION: Introduction to basic electrical theory, relay control circuits, and electrical motor starters for controlling fluid power systems.

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

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

LENGTH OF COURSE: 2 credits

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

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

1) ACADEMIC CONTENT: The student will receive the knowledge and skills to design and connect pneumatic circuits, hydraulic circuits, and to fabricate various fluid power assemblies.
2) THINKING SKILLS: The student will systematically solve fabrication, hydraulic circuit and pneumatic circuit problems
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.

LEARNING/TEACHING TECHNIQUES used in the course are:

X Collaborative Learning       X Problem Solving
☐ Student Presentations      ☐ Interactive Lectures
☐ Creative Projects         ☐ Individual Coaching
☐ Lecture                 X Films/Videos/Slides
X Demonstrations       ☐ Other (describe below)
X Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

X Reading       X Tests       X Individual Projects
☐ Oral Presentations ☐ Worksheets       X Collaborative Projects
LIST OF EXPECTED COURSE OUTCOMES:

1. explain student responsibilities/ safety practices
2. explain electrical symbols
3. explain Ohm's Law (voltage, current, power, and resistance)
4. calculate Ohm's Law problems.
5. calculate series D.C. circuit parameter
6. calculate parallel D.C. circuits parameters
7. explain volt-ohmmeter usage
8. explain limit switches operation
9. explain proximity switches operation
10. explain pressure switch operation
11. explain drawing control schematics rules
12. explain electrical flow sequence and wiring diagram usage
13. explain relay operation
14. design one cycle and continuous reciprocation circuits using 4-way valve
15. design emergency stop circuit
16. design selector switch circuit w/2 pos 4-way valve
17. design one cycle circuit w/2 pos 4-way and 3 pos 4-way valve
18. design pump unloading control circuits
19. design selector circuit using 3 pos 4-way valve
20. design sequence circuits using various valves
21. design circuits using various time delay relays
22. explain multiple cam timer operation
23. explain two-hand safety circuit theory
24. apply 3-phase motor starter circuits
25. describe solid state controls
26. describe 3-phase motor starter circuit
27. describe 3-phase reversing motor starter
28. describe various power distribution systems

LEARNING/TEACHING TECHNIQUES used in the course are:

- Collaborative Learning
- Problem Solving
- Student Presentations
- Interactive Lectures
- Creative Projects
- Individual Coaching
- Lecture
- Films/Videos/Slides
- Lab
- Other (describe below)

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- Reading
- Tests
- Individual Projects
- Oral Presentations
- Worksheets
- Collaborative Projects
EXPECTED STUDENT LEARNING OUTCOMES:

29. describe 3-phase induction motor selection
30. design complete electrical systems
31. describe single phase electric motors
32. describe transformer function
33. select transformers

Student Contributions
1. Attend all classes.
2. Provided calculator, writing utensils, paper, etc. needed for class.
3. Complete all assignments on time.

Course Evaluation
The evaluation will consist of timely written evaluations. All tests will be graded as follows: A, B, C, D, F.

Course Schedule
If possible, the course will be addressed in the sequence as listed. If all content cannot be covered, low frequency goals will be dropped and an explanation will be provided to the student.

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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