Faculty is 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 Academic Affairs and Standards Council.

DEPT. MECH  COURSE NUMBER: 2105

NUMBER OF CREDITS: 4 (2 lecture, 2 lab)

COURSE TITLE: Advanced Fluid Power Systems I

CATALOG DESCRIPTION: Provides students the opportunity to design, plumb, and operate various advanced hydraulic, pneumatic, and electrical control circuits.

AUDIENCE: Mechatronics students

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

Area: by meeting the following competencies:
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Area: by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:
Successful completion year one of the Mechatronics diploma or A.A.S. degree program or equivalent work experience.

LENGTH OF COURSE: 1 Semester

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

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

ACADEMIC CONTENT: The academic objectives of this course are:
Demonstrating the knowledge and skill needed to perform functional tests on pneumatic and hydraulic components and systems.

THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
Performing tests with an examination (or discussion) of the rationale for each test.

COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
a. Participating in class discussions and reports
b. Participating in assignments, worksheets, and reports

HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:

a. Participating in classroom discussions
b. Working with other students on research and lab activities
c. Working with students from other cultures

TOPICS TO BE COVERED:
1. Product specifications
2. Design and draw circuits per specifications
3. Model numbers/parts drawings
4. Fittings/part numbers/descriptions
5. Seals
6. Component testing
7. Hi-low pump unloading circuit
8. Hydraulic motor testing
9. Hydraulic motor circuits
10. Series/parallel hydraulic motor circuit
11. Open loop hydraulic pumps
12. Electro-pneumatic circuits
13. Dual sequence circuit
14. Pneumatic quick-exhaust valve circuit
15. Back pressure sensors
16. Ross two-hand safety circuit
17. Proportional regulators
18. Dual supply pneumatic circuits
19. Pneumatic hi-low pressure circuit
20. Pneumatic positioning circuit
21. Single air-oil booster
22. Burst test
23. Troubleshoot automated machine
24. Gas Metal Arc Welding
25. Shielded Metal Arc Welding
26. Oxy-acetylene torch and plasma cutter

COURSE LEARNING OUTCOMES (GENERAL):
1. Design and test the functions of specified hydraulic and pneumatic components.
2. Determine proper function of components in a system.
STUDENT LEARNING OUTCOMES (SPECIFIC):
1. Research product specifications
2. Design and draw circuits per specifications
3. Identify model numbers/parts drawings
4. Determine proper fittings/part numbers/descriptions
5. Identify various seals
6. Test specified components
7. Design and operate hi-low pump unloading circuit
8. Test hydraulic motors
9. Design hydraulic motor circuits
10. Design series/parallel hydraulic motor circuit
11. Test specified open loop hydraulic pumps
12. Design and operate electro-pneumatic circuits
13. Design dual sequence circuit
14. Design and operate specified pneumatic quick-exhaust valve circuit
15. Design and operate circuit suing back pressure sensors
16. Design and operate Ross two-hand safety circuit
17. Operate proportional regulators
18. Design and operate specified pneumatic dual supply pneumatic circuits
19. Design and operate pneumatic hi-low pressure circuit
20. Design and operate pneumatic positioning circuit
21. Design and operate single air-oil booster
22. Perform a burst test
23. Troubleshoot an automated machine
24. Operate a Gas Metal Arc welder
25. Operate a Shielded Metal Arc welder
26. Operate an oxy-acetylene torch and plasma cutter

LEARNING/TEACHING TECHNIQUES used in the course are:
☒ Collaborative Learning
☒ Student Presentations
☐ Creative Projects
☒ Lecture
☒ Demonstrations
☒ Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:
☒ Reading
☒ Oral Presentations
☐ Textbook Problems
☐ Group Problems
☐ Other (describe below)
☐ Tests
☒ Worksheets
☒ Papers
☐ Term Paper
☒ Individual Projects
☐ Collaborative Projects
☐ Portfolio
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.

The information in this course outline is subject to revision

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 via your preferred Telecommunications Relay Service.

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Revised 10/1/16