Course Information Form (CIF)

Course Code: MFX 153

Course Title: Intermediate Hydraulics II

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0303
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 0.5-1-1
Credit Hour Distribution:

Lecture: 0.5	Lab: 1	Clinical: 0	**Total: 1**

General Course Information

Catalog Description

Builds on basic hydraulic skills, teaching hydraulic components and system applications. Industry-relevant skills related to new topics including operation, installation, performance analysis, and design. Remote pressure control, pump unloading circuits, P-port check valves, and accumulator sizing.

General Course Objectives

Students will learn industry-relevant skills.

Minimum Placement Levels

English	Reading	Math
Placement into ENG 098	Placement into CCS 098	Placement into MAT 059

Prerequisites

None

Methods of Evaluation

5 quizzes.

Instructional Materials and Additional Supplies

Amatrol Course Code

Course Content

General Learning Outcomes (GLOs)

- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.
- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Remote Pressure Control	1. Describe the operation of a remote-controlled relief valve circuit. 2. Connect and operate a remotely controlled pilot-operated relief valve circuit. 3. Describe multiple pressure relief valve operation and give one application. 4. Design a circuit to provide a two-pressure control with unloading.	0.5	1	0
Pressure Port Check Valve Circuit	1. Explain how actuator relaxation occurs in a multi-actuator circuit. 2. Describe the operation of a P-port check valve circuit. 3. Connect and operate a P-port check valve circuit. 4. Describe the construction of an integral P-port check valve.	1	2	0
Pilot-Operated Check Valves	1. Describe the function of a pilot-operated check valve and give an application. 2. Describe the operation of a pilot-operated check valve and give its symbol. 3. Connect and operate a pilot-operated check valve.	0.5	1	0
Pilot-Operated Check Valve Applications	1. Describe the operation of load-lock circuits using one POC valve. 2. Connect and operate a load-lock circuit. 3. Describe the operation of load-lock circuits that use two POC valves. 4. Describe the operation of a double POC valve. 5. Describe the function of a prefill valve and give an application.	1	2	0
Pilot-Operated Check Valve Circuit Design	1. Define POC valve pilot ratio and explain its importance. 2. Measure pilot-operated check valve pilot pressure. 3. Describe how to calculate the pressure required to open a POC valve. 4. Calculate the pilot pressure required to open a POC valve. 5. Define pressure intensification and explain its importance. 6. Describe how to calculate the maximum pressure in a POC valve circuit. 7. Calculate the maximum pressure in a POC valve circuit. 8. Describe the function and operation of a POC valve with decompression poppet. 9. List five application guidelines for POC valves. 10. Design a POC valve circuit.	1	2	0
Accumulator Operation	1. Describe the function of an accumulator and give an application. 2. Describe the operation of three types of accumulators and give their schematic symbols. 3. Describe the operation of the four types of gas-loaded accumulators. 4. Describe how to pre-charge a gas-loaded accumulator. 5. Pre-charge an accumulator. 6. Determine accumulator pre-charge pressure.	0.5	2	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Accumulator Circuits	1. List accumulator safety rules. 2. Describe how to mount an accumulator. 3. Describe the function and operation of two types of safety bleed-down circuits. 4. Connect and operate an accumulator bleed-down circuit. 5. Describe the function and operation of two accumulator unloading circuits.	1	2	0
Accumulator Applications	1. Describe the operation of a circuit that uses an accumulator for auxiliary power. 2. Describe the operation of a circuit that uses an accumulator for emergency power. 3. Connect and operate an accumulator to safely provide auxiliary and/or emergency power. 4. Describe the operation of a circuit that uses an accumulator for pulsation dampening. 5. Describe the operation of an accumulator leakage/temperature compensation circuit. 6. Design an accumulator circuit to compensate for leakage. 7. Describe the operation of a circuit that uses an accumulator for fluid dispensing. 8. Describe the operation of a circuit that uses an accumulator for energy savings.	1	2	0
Accumulator Sizing	1. Explain how bladder-type accumulators are specified. 2. Explain how to size a bladder-type accumulator. 3. Size a bladder-type accumulator. 4. Describe the effect of pre-charge pressure on accumulator operation.	1	1	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
7.5	15	0