Course Information Form (CIF)

Course Code: MFX 152

Course Title: Intermediate Hydraulics I

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.

General Course Objectives

Students will learn industry-relevant skills related to new topics.

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
Overview of the DCV	1. Describe and explain the terms used to specify DCVs. 2. Connect and operate a hydraulic DCV with a tandem center. 3. Select the spool option for a hydraulic DCV based on the application information.	0.5	1	0
Two-Position DCVs	1. Describe the function of a hydraulic 4/2 DCV and name one application. 2. Describe the operation of a hydraulic 4/2 DCV and give its schematic symbol. 3. Connect and operate a hydraulic 4/2 DCV. 4. Describe the function of a hydraulic 3/2 DCV and name one application. 5. Describe the operation of a hydraulic 3/2 DCV and give its schematic symbol. 6. Connect and operate a 4/2 DCV to function as a 3/2 DCV. 7. Design a hydraulic circuit using a 2-position DCV.	0.5	2	0
Pilot-Operated DCVs	1. Describe the function of a hydraulic pilot-operated DCV and name one application. 2. Describe the operation of a hydraulic pilot-operated DCV and give a schematic symbol. 3. Connect and operate a hydraulic pilot-operated DCV.	0.5	1	0
Cam-Operated DCVs	1. Describe the function of a hydraulic cam-operated valve and name one application. 2. List two types of hydraulic cam-operated valves and describe their application. 3. Describe the operation of a hydraulic 4/2 cam-operated valve and give its schematic symbol. 4. Connect, adjust, and operate a cam-operated hydraulic valve. 5. Design a hydraulic sequence circuit using a cam-operated hydraulic valve. 6. Design a rapid traverse-slow feed hydraulic circuit using a cam-operated valve.	0.5	2	0
Cylinder Types	1. Describe the operation of four types of cylinders and give an application of each. 2. Describe the construction of two types of cylinders and give an application of each. 3. Describe three common cylinder mounting styles and give an application of each. 4. Describe three common cylinder feature options. 5. Select a cylinder mounting style for a given application.	0.5	2	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Regeneration Circuits	1. Describe the principle of cylinder regeneration and name an application. 2. Describe the operation of a basic regeneration circuit. 3. Connect and operate a basic regeneration circuit. 4. Describe how to calculate the extend speed of a cylinder in regeneration. 5. Calculate the extend speed of a cylinder in regeneration. 6. Describe how to calculate the extend force of a cylinder in regeneration. 7. Calculate the extend force of a cylinder in regeneration.	0.5	2	0
Pressure-Compensated Flow Control Valves	1. Describe the function of a pressure-compensated flow control valve and name one application. 2. Describe the operation of a pressure-compensated flow control valve and give its schematic symbol. 3. Connect and adjust a pressure-compensated flow control valve.	1	1	0
Synchronization Circuits	1. Describe the function of a double-rod cylinder and name one application. 2. Describe the operation of a double-rod cylinder and give its symbol. 3. Define cylinder synchronization and name three applications. 4. Explain why cylinders do not operate in synchronization. 5. List and describe the operation of five methods used to synchronize cylinders. 6. Set up, adjust, and operate a cylinder synchronization circuit using flow control valves. 7. Set up and operate a synchronization circuit using series actuators.	1.5	2	0
Pilot-Operated Relief Valve Operation	1. Explain the advantage of a pilot-operated relief valve. 2. Describe the operation of a pilot-operated relief valve and give its complete schematic symbol.	1	0	0
Pump Unloading Applications	1. Describe the function of the vent port of a pilot-operated relief valve. 2. Describe two methods of pump unloading and give an application of each. 3. Connect a pilot-operated relief valve to unload a pump by venting.	1	2	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
7.5	15	0