Course Information Form (CIF)

Course Code: MFX 131

Course Title: Basic Pneumatics 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

Prepares learners to work intelligently in industry with pneumatic applications. Introduction of the principles of pneumatic pressure and flow, pneumatic speed control circuits. Pressure regulation, air filtration, how to connect pneumatic circuits, pneumatic cylinders, valves and actuators, a wide array of pneumatic applications, pressure and cylinder force, pneumatic leverage, pressure and volume, and air flow resistance.

General Course Objectives

Prepares students to work intelligently in industry with pneumatic applications.

Minimum Placement Levels

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

Prerequisites

None

Methods of Evaluation

There will be 5 quizzes.

Instructional Materials and Additional Supplies

Amatrol course code

Course Content

General Learning Outcomes (GLOs)

- 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
Pressure vs. Cylinder Force	1. Describe how to calculate the force output of an extending cylinder. 2. Calculate the extension force of a cylinder given its size and pressure. 3. Measure the force output of an extending cylinder. 4. Describe how to calculate the force output of a cylinder in retraction (pull). 5. Calculate the retraction force of a cylinder given its size and pressure.	1	2.5	0
Pneumatic Leverage	1. State Pascal's Law and explain its significance in pneumatics. 2. Explain how force is multiplied using Pascal's Law.	0.5	0	0
Pressure and Volume	1. Describe two methods of representing pressure. 2. Convert between gauge and absolute pressures. 3. Explain how air pressure is created in a pneumatic system. 4. State Boyle's Law and explain its significance. 5. Apply Boyle's Law to calculate changes in pressure and volume.	1	2	0
Air Flow and Resistance	1. Explain how a pneumatic system creates air flow. 2. Describe two types of resistance in a pneumatic system. 3. Explain how Delta P describes pneumatic resistance and explain its importance. 4. Measure Delta P across pneumatic components. 5. Describe what determines the speed of a pneumatic actuator.	1	2	0
Air Flow Control and Measurement	1. Describe the main function of a pneumatic needle valve and give an application. 2. Describe the operation of a needle valve and give its schematic symbol. 3. Connect and operate a needle valve to control actuator speed. 4. Define air flow rate and give its units of measurement. 5. Convert air volumes at pressures to free air volumes. 6. Describe the function of a flow meter and give an application. 7. Describe the operation of a rotameter and give its schematic symbol. 8. Connect and read a flow meter.	1	2	0
Flow Control Valves	1. Describe the function of the flow control valve and give an application. 2. Describe the operation of a flow control valve and give its schematic symbol. 3. Connect and operate a flow control valve to control actuator speed. 4. Describe the effect of actuator load changes on flow control operation.	1	2	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Speed Control	1. Describe the operation of a meter-in flow control circuit and give an application. 2. Connect and operate a meter-in flow control circuit. 3. Describe the operation of a meter-out flow control circuit and give an application. 4. Connect and operate a meter-out flow control circuit. 5. Describe the operation of an exhaust port speed control and give an application. 6. Connect and operate an exhaust port speed control circuit. 7. Describe the operation of a pressure port speed control and give an application. 8. Connect and operate a pressure port speed control circuit. 9. Design speed control circuits. 10. Define independent speed control and give an application. 11. Design an independent speed control circuit.	2	4.5	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
7.5	15	0