



South Central College

MECA 2120 Fluid Power 1

Course Outcome Summary

Course Information

Description This course provides the basics of fluid powered devices and systems found in modern industrial machinery and automation. Topics include proper safety procedures, basic laws of fluid mechanics, standard symbols, pumps, control valves, control assemblies, actuators, maintenance procedures, and switching and control devices. At the completion of this course, the student will be able to apply basic laws of fluid mechanics to design and specify characteristics of a pneumatic system; select and size actuators and control valves, and match the pneumatic components with its American National Standards Institute (ANSI) symbol. Upon completion of this course, the student should be able to identify long-term symptoms associated with a lack of preventive maintenance of pneumatic components while demonstrating good safety practices including lock out procedures. Technical writing skills and safety procedures will be implemented throughout the course. (Prerequisites: None)

Total Credits 3

Total Hours 64

Types of Instruction

Instruction Type	Credits/Hours
Lecture	2/32
Lab	1/32

Pre/Corequisites

None

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Describe principles of pneumatics.

Learning Objectives

Discuss fluid power systems.
Recognize pneumatic systems.
Analyze force, weight and mass.
Identify pressure and air properties.
Describe work and energy.

2. Illustrate pneumatics logic schematics.

Learning Objectives

Identify basic logic elements.
Create pneumatic symbol library.
Draw air logic schematic.

3. Define compressors.

Learning Objectives

Explain compressor operation.
Describe the various compressor types.
Identify lubrication and non-lubrication.

4. Explain primary air treatment.

Learning Objectives

Explain air treatment.
Characterize preliminary filtering.
Identify the effect of moisture and air dryers.
Install dry and wet filter.

5. Explain air flow rate.

Learning Objectives

Discuss air flow rate and give its units of measurement.
Incorporate safety.
Describe the operation of a flow meter and give an application.
Demonstrate a flow meter application.
Explain the operation of exhaust port speed control.
Explain the operation of a pressure port speed control.

6. Implement piping, hoses and tubing.

Learning Objectives

Identify piping and tubing requirements.
Identify hoses and hose fittings.
Configure a compressed-air piping system.

7. Integrate control valves.

Learning Objectives

Identify control valves.
Demonstrate manually and automatically operated valves.
Explain control valve elements.
Explain pressure-control valves.

8. Identify cylinders.

Learning Objectives

Identify pneumatic cylinders.
Demonstrate single-acting cylinders.
Demonstrate double-acting cylinders.
Demonstrate cushioning.
Explain cylinder selection.

9. Explain pneumatic motors.

Learning Objectives

Explain pneumatic motors.
Incorporate safety.
Review pneumatic motor construction.
Utilize pneumatic motors in a compressed-air system.

10. Display pneumatic system maintenance.**Learning Objectives**

Identify maintenance schedule.
Create parts list.
Demonstrate trouble-shooting practices.

11. Define vacuum power systems.**Learning Objectives**

Identify principles of vacuum power.
Describe vacuum pump basic operation.
Use vacuum regulation and filtering.
Demonstrate linear and rotary motion with vacuum.
Explain Venturi vacuum generator principles.

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.