PNEUMATIC AND HYDRAULIC

Course Description

The Pneumatic and Hydraulic Systems course provides comprehensive training on the principles, design, and practical implementation of pneumatic and hydraulic systems. Participants will gain a deep understanding of the fundamental concepts, components, and control techniques used in these systems. Trainees will develop their skills in designing, troubleshooting and maintaining efficient pneumatic and hydraulic systems in industrial automation settings.

Course Objectives

After completing this course, you will be able to:

- Gain knowledge of fluid physics principles.
- Acquire familiarity with industry-standard symbols used in fluid power systems.
- Analyze and interpret pneumatic and hydraulic circuit diagrams.
- Understand the operation and functionality of standard cylinders and valves.
- Gain knowledge of pneumatic control systems.
- Identify how to specify and select the appropriate components for a system.
- Develop an understanding of safety practices in working with pneumatic and hydraulic systems.

Course Outline:

❖ **Introduction to Fluid Power Systems:**

- Understanding the physical principles of pneumatic and hydraulic systems.
- Differentiating between electrical, hydraulic, and pneumatic systems.
- Exploring the applications of pneumatic and hydraulic systems, including electro-hydraulic systems.

❖ **Hydraulic Systems:**

Components of hydraulic systems, such as power units, reservoirs, filters, piping, hoses, and accumulators.

❖ **Pneumatic Systems:**

Exploring pneumatic systems and their components, including service units, compressors (piston, screw, rotary), filters, air dryers, lubricators, pressure regulation valves, control valves, actuators, and pneumatic circuits.

- **System Design and Representation:**
  - Understanding standard symbols used in fluid power systems.
  - Analyzing and interpreting circuit diagrams.
  - Utilizing technical data for system design considerations.

- **Valves:**
  - Different types of valves, including spool valves, poppet valves, pilot-operated valves, pressure control valves, flow control valves, check valves, sequence valves, proportional valves, servo valves, cartridge valves, and modular valves.
  - Examining pressure relief valves, pressure regulators, directional control valves, non-return valves, and flow control valves.

- **Actuators:**
  Understanding rotary actuators (motors) and linear actuators (cylinders).

- **Safety Regulations:**
  Complying with safety regulations in working with pneumatic and hydraulic systems.

- **Basic Logic Elements and Functions:**
  Exploring fundamental logic elements and their functions in fluid power systems.

- **Wiring and Circuit Connections:**
  Understanding the wiring and connection principles for pneumatic and hydraulic circuits.

Course Duration

3 days, 6 hours /day