

**Course Overview:**

This highly relevant seminar is intended for all operators and technicians involved in operation and maintenance, and those are responsible for general mechanical, electrical management for maintenance, operation in different aspects of mechanical maintenance or electrical procedures, and persons who are interested to work plant area.

**Course Objective:**

- Understanding basic information level of processes and equipment (Valves,Pumps,Compressors) in order to apply suitable techniques and to be familiar with principles of mechanical and electrical (Instrumentation Diagrams,Basics of reading P & ID)
- Have an overview on the evolution of Electrical, Mechanical (Thermal Radiation,Heat Transfer Analysis,) and Safety Work Standards and its recent advancements

**Course Outline:****Day-1**

- Introduction to Fluids
- Fluid Properties
- introduction for hydraulic & Pneumatic theory
- Types of Pumps
- Introduction to Centrifugal Pumps · Axial Compressors
- Reciprocating Pumps
- Types of Compressors

**Day-2**

- Introduction to Valves
- Valves materials of construction
- Gate, Globe, and Needle Valves
- Plug, Ball, and Butterfly Valves
- Diaphragm, Pinch, and Check Valves
- Relief Valves and Safety Valves
- Introduction to Actuators
- Pneumatic, Electric, Hydraulic Actuators
- Control Valves Principles & components

**Day-3**

- Electricity
- AC & DC CONCEPTS
- Conductors and Insulators
- Voltage
- Units of Measurements
- Ohms Law
- Common Causes of Circuit Failure
- Alternating Current AC
- Comparison of AC & DC waveforms

**Training Language:**

EN / AR

**Training Methodology:**

- Presentation & Slides
- Audio Visual Aids
- Interactive Discussion
- Participatory Exercise
- Action Learning
- Class Activities
- Case Studies
- Workshops
- Simulation

-Periodic Time, Cycle & Frequencies

Day-4

-Types of flow diagrams

-Flow diagram symbols

-Process & Instrumentation Diagrams

-Basics of reading P & ID

-Samples of P & ID

-Written Assessment

Day-5

-heat transfer Introduction

-types of heat exchangers

-Double Jacket Pipes

-Shell & Tube heat exchanger / plate heat exchanger

-Convection cooling

-Thermal Radiation

### **Who Should Attend:**

All operators and technicians involved in operation and maintenance, and those are responsible for general mechanical, electrical, operation in different aspects of mechanical maintenance or electrical procedures, and persons who are interested to work plant area.