

Mechanical Level I

Mechanical Level I

This five-day course is the first level of a fifteen-day training program designed to give plant technicians a greater depth of knowledge and skill in various mechanical equipment job functions. Major course topics include basic soldering, basic tools (hand/power), bearing maintenance, bolting and torque, hydraulics, industrial rigging, lubrication, mechanical (power) transmission, orifice meters, pneumatics, power plant fundamentals, precision measuring instruments, print reading, fans and blowers, technical math, troubleshooting, and valve maintenance.

I. Basic Soldering

- Soldering Equipment
- Soldering Techniques

II. Basic Tools

- Accident Prevention
- Types of Hand Tools

III. Bearing Maintenance

- Basic Concept of Bearings
- Major Bearing Classifications
- Bearing Maintenance

IV. Bolting

- Screw Threads
- Fastener Materials
- Torque and Tension

V. Hydraulics

- Hydraulic Development
- Physics of Hydraulics
- Hydraulic Symbols
- Hydraulic Components
- Hydraulic Systems

VI. Industrial Rigging

- Rigging Safety
- Rigging Equipment
- Rigging Fundamentals
- Moving and Manipulating Loads

VII. Lubrication Fundamentals

- Basics of Lubrication
- Lubricants
- Operating Machinery Wear and Erosion
- Bearing Lubrication
- Methods of Oil Supply
- Proper Lubrication
- Lubrication Testing and Sampling

VIII. Mechanical Transmission

- Gears
- Clutches
- Belt Drives
- Chain Drives

IX. Orifice Meters

- Why Measurement Is So Critical
- Orifice Measurement Theory
- Measurement Components

X. Pneumatics

- Pneumatic Theory
- Pneumatic Components
- Pneumatic Circuits

XI. Power Plant Fundamentals

- Simple Power Plants
- Basic Energy Processes and Equipment
- Boiler Feedwater Cycle
- Pressure and Flow
- Temperature and Heat
- Properties of Water

XII. Precision Measuring Instruments

- Gauging Fundamentals
- Metrology
- Standard Tools for Measuring and Inspection

XIII. Print Reading

- Blueprints
- Fluid Power Drawings
- Piping and Instrumentation Diagrams

XIV. Fans and Blowers

- Fans
- Blowers

XV. Technical Math

- Decimals, Percentage, and Square Roots
- Algebraic Operations
- Algebraic Operations II
- Algebraic Equations
- Algebraic Word Problems
- Exponents and Radicals
- Logarithms and Scientific Notation
- Geometry
- Geometry II
- Trigonometry

XVI. Troubleshooting Philosophy and Practices

- Troubleshooting Documentation
- Seven-Step Troubleshooting Philosophy
- Troubleshooting With Flowcharts
- Five Action Steps for Systematic Troubleshooting
- Deriving Logical Troubleshooting Flowcharts and Strategies
- Cause and Effect Diagrams

XVII. Valve Maintenance

- Valve Types
- Identification, Marking, and Symbols
- Valve Installation
- Valve Packing and Sealing
- Valve Maintenance and Repair