



ELECTRICAL FUNDAMENTALS & SAFETY

Learn about the fundamentals and principles of AC and DC electrical systems, including electrical safety procedures, lockout/tagout, OSHA requirements, operation of relay contacts, input/output devices, and measuring instruments. Includes hands-on practice using and troubleshooting multi-meters.

Course Outline - Three (3) Days:

Safety Guidelines

- Personal protective equipment (PPE)
- General electrical safety practices
- Lockout/Tagout
- OSHA requirements

Electrical Fundamentals

- Ohm's Law
- Watt's Law
- Electrical symbols
- Series and parallel resistance and capacitance calculations
- Voltage drop calculations

Meter Use

- Multimeter functions
- Amp meters
- Megohmmeters

Electrical Schematics

- Use of symbols in electrical prints
- Reading ladder logic drawings
- Contact arrangements in ladder logic
- Motor start/stop circuits with overload protection
- Types of input devices
- Types of output devices
- Use of input devices as feedback from output devices
- Overload protection in electrical circuits

Prerequisites:

- None

LEARNING OBJECTIVES:

- Apply electrical safety procedures
- Explain lockout/tagout procedures and why they are used
- Identify the most common OSHA violations
- Summarize electrical fundamentals and principles of AC and DC electrical systems
- Interpret symbols found in electrical prints
- Calculate electrical power using power formulas
- Explain when to use a voltmeter, amp meter, or megohmmeter
- Define the terms 'voltage' and 'current'
- Determine resistance and capacitance for parallel and series circuit
- Distinguish the difference between normally-open and normally-closed relay contacts
- Describe the differences between limit, proximity, and photoelectric switches
- Demonstrate the use of different output devices, including valves, motors, and fans

Intended Audience:

- This course is designed for technicians and maintenance personnel that want to improve their proficiency in an industrial environment.