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Basic Electrical Training - For Industrial Applications

View Course Details

COURSE DATES AND TIMES

Why Basic Electrical Training Matters

This instructor-led course introduces essential principles for personnel who install, operate, maintain, or troubleshoot systems. Participants build a clear understanding of how circuits function, why failures occur, and how proper testing improves safety and equipment reliability.

Participants learn how to measure quantities safely, isolate faults, interpret real facility drawings, and apply NEC/CEC wiring rules to everyday tasks. The program emphasizes equipment reliability, preventive maintenance, and safe energized and de-energized work practices in accordance with NFPA 70E, OSHA, and CSA Z462 requirements.

Beginning with voltage, current, resistance, and power, the course shows how to apply Ohm's Law in real-world situations and how electricity behaves in single-phase and three-phase systems. Students then explore NEC and CE Code wiring methods, overcurrent protection, grounding, bonding, and the structure of facility distribution—including transformers, motors, motor controls, panelboards, and switchgear.

Participants learn how to identify and resolve common issues such as short circuits, overloaded circuits, failed components, poor connections, motor faults, and grounding problems. Emphasis is placed on fault isolation, meter-based diagnostics, and preventive maintenance strategies aligned with NFPA 70B and CSA Z463.

Electrical safety is a central focus. The course explains NFPA 70E and CSA Z462 requirements for shock protection, arc-flash boundaries, labeling, PPE selection, lockout/tagout, and safe approach distances, ensuring workers understand how to recognize hazards, assess risk, and maintain compliance in the workplace.

Learning Outcomes

Students will learn to:

- Understand the relationships between voltage, current, resistance, and power.
- Read and interpret drawings and schematics.
- Identify components such as fuses, breakers, and conductors.
- Apply safe work practices, including PPE and lockout/tagout.
- Troubleshoot simple circuits and perform preventive maintenance.

WHO SHOULD ATTEND

This course is designed for:

- Apprentice and maintenance electricians
- Plant operators and industrial maintenance staff
- Facility and safety managers overseeing systems
- Technicians working near energized equipment

STUDENTS RECEIVE

- Basic Electrical Training Course Certificate
- 1.2 Continuing Education Unit (CEU) Credits (12 Professional Development Hours)
- FREE 100-Page Digital Electrical Maintenance Handbook (Value $20)
- $100 Coupon Toward any Future Electricity Forum Event (Restrictions Apply)

- FREE Magazine Subscription (Value $25.00)
- Course Materials in PDF Format

COURSE OUTLINE

Basic Electrical Training For Industrial Applications

DAY ONE

1. Basic Power Fundamentals

• AC and DC concepts in industrial and commercial power systems
• Voltage, current, resistance, and power; applying Ohm’s Law
• Hands-on circuit-building with real components
• Series, parallel, and combination circuits
• Safe use of multimeters: measuring voltage, current, and resistance
• Verifying equipment is de-energized and establishing an safe work condition
• Modes of failure: open circuits, short circuits, ground faults, and overloads
• Understanding power in single-phase and three-phase systems
• Introduction to power quality and equipment loading

2. Electrical Test Equipment

• Digital multimeters, voltage testers, and clamp-on ammeters
• Megohmmeters, continuity testers, and insulation resistance testing
• Testing under load vs. no-load conditions
• Safe testing techniques based on NFPA 70E

3. Basic Testing and Troubleshooting Techniques

• Reading single-line diagrams and schematic drawings
• Branch circuit diagnosis and fault isolation
• Control circuit troubleshooting
• Meter-based diagnostics: systematic testing and step-by-step workflows
• Documenting test results and corrective actions

4. Understanding Facility Electrical Systems (Part 1)

• Overview of distribution systems
• Electrical floor plans and facility wiring practices
• Low-voltage equipment: panels, transformers, disconnects, breakers
• 120/208 V, 277/480 V, and 347/600 V system examples
• Power factor basics and correction equipment
• Delta vs. wye systems and grounding configurations
• Switchgear fundamentals: metal-clad and metal-enclosed equipment
• Overcurrent protection: fuses, molded-case circuit breakers, and power breakers
• Arc-flash considerations in low-voltage distribution equipment

DAY TWO

5. Understanding Facility Electrical Systems (Part 2)

• Feeders, branch circuits, panelboards, and distribution layouts
• Motors, motor starters, VFD basics, and motor control centers (MCCs)
• Transformers, UPS systems, and battery maintenance basics
• Backup generators and automatic transfer switches
• Grounding and bonding requirements (NEC/CEC compliant)
• Building automation systems and low-voltage control wiring
• Fire alarm and life safety systems
• Common equipment failures and reliability strategies

6. Electrical Safety in the Workplace

• Introduction to NFPA 70E / CSA Z462
• Electrical hazards: shock, arc flash, and arc blast
• Approach boundaries and arc-flash labels
• PPE categories and hazard risk assessment
• Lockout/tagout (LOTO) procedures and OSHA requirements
• Establishing an safe work condition
• Developing facility electrical safety programs and safe work practices

7. Overview – NFPA 70B / CSA Z463 Electrical Maintenance Standards

• Proactive vs. reactive maintenance strategies
• Maintenance tasks for motors, transformers, breakers, and cables
• Insulation testing and thermographic inspections
• Linking maintenance to safety and system reliability
• Equipment-specific best practices to reduce downtime and failures

COURSE TIMETABLE

Both days:

Start: 10:00 a.m. Eastern Time
Finish: 4:30 p.m. Eastern Time

Contact us Today for a FREE quotation to deliver this course at your company’s location.

Request Quote