

ELECTRICAL FUNDAMENTALS & DIAGNOSTICS TECHNIQUES



OUR ACCREDITATION & PARTNERS



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OVERALL DESCRIPTION:

In an increasingly complex and automated business landscape, the reliability and safety of your electrical systems are not just a technical concern—they're a strategic business imperative. This course is designed to equip your team with the essential knowledge and practical skills needed to navigate the intricacies of modern electrical systems with confidence and precision. By moving beyond basic theory and focusing on hands-on diagnostics, we empower your personnel to proactively identify and resolve issues, minimize costly downtime, and, most importantly, ensure a safer operational environment. This program transforms technicians from reactive problem-solvers into skilled, strategic assets who can safeguard your company's continuous operation and bottom line.

Course Objectives:

Upon completion of this course, participants will have the knowledge and skills to:

- **Master Core Principles:** Explain and apply fundamental electrical concepts, including voltage, current, resistance, and power, and apply Ohm's Law in practical scenarios.
- **Identify Components:** Recognize and understand the function of common electrical components and their role in AC and DC circuits.
- **Utilize Diagnostic Tools:** Confidently use a range of test equipment, such as multimeters, oscilloscopes, and clamp meters, to take accurate measurements and interpret data.
- **Implement Systematic Troubleshooting:** Develop and apply a logical, step-by-step methodology to diagnose and resolve electrical faults efficiently.
- **Prioritize Safety:** Understand and apply critical safety practices and regulations, including Lockout/Tagout (LOTO) procedures, to prevent electrical hazards and ensure a safe working environment.
- **Improve Equipment Uptime:** Reduce troubleshooting time and minimize unscheduled downtime by applying effective diagnostic techniques.



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Course Outline:

- **Foundational Electrical Theory:** Atoms and electrons, voltage, current, resistance, and power. Ohm's Law and the Power formula.
- **AC and DC Circuits:** Understanding the differences, series and parallel circuits, and basic circuit analysis.
- **Essential Test Equipment:** Proper use and interpretation of readings from digital multimeters (DMMs), clamp meters, and megohmmeters.
- **Schematics and Diagrams:** Reading and interpreting electrical blueprints, schematics, and wiring diagrams to trace circuits and identify components.
- **Systematic Troubleshooting Methods:** The "5-Step Troubleshooting Process," flowchart-based diagnostics, and the art of logical deduction.
- **Practical Diagnostic Techniques:** Hands-on exercises for identifying shorts, opens, and ground faults in various circuits.
- **Electrical Safety and Regulations:** Personal Protective Equipment (PPE), industry standards (e.g., NFPA 70E), and comprehensive LOTO procedures.

WHO SHOULD ATTEND?

This course is ideal for anyone involved in the maintenance, operation, or repair of electrical systems, including:

- Maintenance and Field Service Technicians
- Electrical and Mechanical Engineers
- Maintenance Supervisors and Managers
- Installation and Commissioning Personnel
- Anyone needing to enhance their electrical troubleshooting skills.

Course Methodology:

We utilize a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. This training course will be conducted as a highly interactive workshop session. A variety of training methodologies will be used Before and during the course whenever applicable. Some of these methods are gamification, online pre-post test, role plays, self-assessment instruments, group exercises & case studies.

