

# Basic Electricity - Virtual

**3 Days, 2.1 CEUs**

A firm grasp of the fundamentals of electricity is the basis for becoming a successful electrical maintenance technician. Often, maintenance personnel have to jump right into electrical maintenance with no training, or minimal on-the-job training that skips the fundamentals and focuses solely on a specific application. This may result in technicians performing tasks without understanding the reason why or the implications of changes they are making on the electrical circuit. All this can lead to unsafe activities and damages to electrical equipment.

This course provides basic information regarding quantifying and measuring basic elements in a DC and AC electrical circuit. Participants are introduced to basic electrical circuit components and basic circuitry troubleshooting. This course is intended for new or cross-training technicians, electricians and supervisors responsible for maintenance of electrical equipment.

## Pre-Requisites

The participant needs to have fundamentals of basic math and should bring a scientific calculator

## Learning Objectives

To receive 2.1 CEUs, the participant must attend 3 days of virtual classes (21 contact hours) and attain a minimum grade of 80% on the final exam. Upon completion of this course, the participant will demonstrate that he/she is able to:

- Identify basic atomic components, laws and electrical terms
- Determine direct current and alternating current fundamentals
- Apply Ohm's Law to demonstrate the relationship between current, voltage, and resistance
- Calculate and measure resistance, voltage, current and power in series, parallel and combination circuits

## SCOPE

### Day 1\* (7 contact hours)

- I. Introduction
- II. Basics of Electricity
  - A. Electron
  - B. Proton
  - C. Neutron
- III. Law of Charges
  - A. Nucleonic Force
  - B. Centrifugal Force
- IV. Electrical Conductors, Insulators, and Semiconductors
  - A. Conductors
  - B. Insulators
  - C. Semiconductors
- V. Producing Electricity
  - A. Current Flow
  - B. Short Circuits
  - C. Resistance

### Day 2 (7 contact hours)

- VI. Ohm's Law
  - A. Ohm's Law as an Equation
  - B. Current/Voltage Relationship
  - C. Current/Resistance Relationship
- VII. Circuit Theories
  - A. Kirchoff's Current Law
  - B. Kirchoff's Voltage Law
- VIII. Types of Circuits
  - A. Series Circuits
  - B. Parallel Circuits
  - C. Combination Circuits

### Day 3 (7 contact hours)

- IX. Alternating Current vs. Direct Current
  - A. AC Voltage
  - B. Waveforms
  - C. Rectification
- X. AC Circuits
  - A. Loads
  - B. Resistance
  - C. Inductance
  - D. Capacitance
- XI. Conclusion
  - A. Review
  - B. Final Exam

\*Class scheduling times may vary based on discussions and size of class