

# Basic Electricity

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. This can lead to unsafe work practices and damages to electrical equipment.

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

## Lab and Classroom Attire

AVO is committed to the personal safety of each participant and requires safety glasses, long pants, and ANSI rated "safety-toe" work shoes for lab activities. Lecture courses may involve a tour of a work or shop area and for this reason open-toe shoes and shorts are not considered appropriate attire for the classroom.

## Learning Objectives

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

- Identify the basic atomic components and laws that constitute electricity and the production of energy.
- Calculate current, voltage, and resistance of series, parallel, and series-parallel circuits using Ohm's and Kirchhoff's laws.
- Apply circuit fundamentals to alternating current components and processes.
- Apply the principles of electromagnetic induction as it applies to the construction, connecting components, and basic operation of transformers in order to calculate transformer variables.

## SCOPE

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

- I. Introduction
- II. Fundamentals of Electricity
  - A. Principles of Matter
  - B. Electrical Conductors, Insulators and Semiconductors
  - C. Producing Electricity
- III. Electrical Circuits
  - A. Ohm's Law
  - B. Resistors
  - C. Electrical Power
  - D. Decimals and Scientific Notation

### Day 2 (7 contact hours)

- III. Electrical Circuits (cont'd)
  - E. Circuit Theories
- IV. Alternating Current
  - A. AC vs. DC
  - B. AC Circuit
  - C. Inductive Reactance
  - D. Capacitive Reactance

### Day 3 (7 contact hours)

- V. Introduction to Transformers
  - A. Transformer Construction
  - B. Transformer Ratings
  - C. Wye Connection
  - D. Delta Connection
- XII. Conclusion
  - A. Review
  - B. Final Exam

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

# STANDARD EQUIPMENT LIST

## BASIC ELECTRICITY

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REVISED: SEPTEMBER 2022  
COURSE NUMBER 345, REV5  
3 DAYS

### **TEXT**

1 / STUDENT

*BASIC ELECTRICITY*

AVO COURSE NUMBER 345, REV5, JANUARY 2022

### **EQUIPMENT**

1 / STUDENT

CALCULATOR

1/ STUDENT

UGLY'S ELECTRICAL REFERENCE

FOR VIRTUAL CLASSES:

CONTENT MATERIAL WILL BE PROVIDED IN DIGITAL FORMAT | 09.14.22