

Basic Electrical Concepts

OEM: Rockwell Automation • Duration: 5 Days (40 hrs) • Code: EMS-100

COURSE MODULES & TOPICS

Objectives

- Identify the types of electrical energy
- Discuss the composition of the atom and its relation to electrical charge
- Explain the characteristics of current, voltage, and resistance
- Explain Kirchhoff's Current Law and Kirchhoff's Voltage Law
- Calculate equivalent resistance of series and parallel resistive circuits
- Calculate DC circuit parameters using Ohm's Law, Kirchhoff's Current Law, and Kirchhoff's Voltage Law
- Describe the characteristics of capacitors and capacitance
- Describe the characteristics of inductors and inductance
- Describe the construction and operation of a simple AC generator
- Define inductive reactance
- Calculate the inductive reactance of a simple AC circuit
- Define capacitive reactance
- Calculate the capacitive reactance of a simple AC circuit
- Define impedance
- Describe the relationship between apparent, true, and reactive power
- Define power factor as it relates to true power and apparent power

Who Should Attend

- I&C technicians
- Electricians
- Electrical Technicians

Student Materials

- Student Manual includes the key concepts, definitions, examples, and activities presented in this course
- Lab Book provides learning activities and hands-on practice

Next Level Learning

- Motor Theory course (EMS-105)

Course Agenda

Day 1

- Distinguishing Conductors and Insulators
- Observing Electrical Safety Precautions
- Defining Electromotive Force/Voltage
- Explaining Current Flow
- Describing the Properties of Resistance

Day 2

- Constructing Series Circuits
- Constructing Parallel Circuits
- Defining Basic Electrical Laws
- Constructing Resistive Circuits

Day 3

- Generating Sine Waves
- Defining Frequency, Period and Wavelength
- Calculating Sine Wave Voltage and Current Values
- Observing AC Phase Relationships

Day 4

- Calculating Resistance in AC Circuits
- Using Inductance in AC Circuits
- Using Capacitance in AC Circuits

Day 5

- Calculating Power in AC Circuits
- Review
- Written Exam

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