AUTOMATION

COURSE EMS100

Basic Electrical Concepts

This course provides information on the basic concepts of direct current (DC) electricity and magnetism, including electrostatics, basic circuit concepts, and measurement of electrical quantities and associated numerical concepts, Ohm's Law, practical circuits, electromagnetism, and electrical measurements. There are hands-on exercises for device operation and simple circuit construction and analysis.

Those in attendance will have the opportunity to combine and practice groups of key skills by completing multiple integrated practices during the course.

Monday, February 10-
Friday, February 14

8 AM - 5 PM

SMC Cape Girardeau
2333 Rusmar St
Cape Girardeau, MO

Cost: $3,653
Includes Lunch

To register, please contact Aislinn Roberts at aroberts@smcelectric.com

COURSE EMS100

Course Overview

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- 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 CurrentLaw, and Kirchhoff's Voltage Law
- Describe the characteristics of capacitors and capacitance
- 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

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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