

Exploring Electrical Systems: AC, DC, and Safety

Category: Electricians COURSE NO: E04G-01I CREDIT: 4 HOURS COURSE PROVIDER: Jad Raydan; Elie Tawil, P.E., LEED AP

PRICE: TBD

Course Highlights

This online interactive video course provides a comprehensive understanding of alternating current (AC) and direct current (DC) circuits, their components, and applications. Moreover, this course presents the fundamentals of electrical safety to ensure a safe workplace.

Part I of this course introduces the fundamentals of alternating current (AC) circuits, key terminology, and AC power generation. It explains the operation of an elementary AC generator, the role of inductors and capacitors in AC systems, and the impact of inductance and capacitance on current flow. This part also highlights the importance of AC power analysis in modern technology.

Part II of this course expands on alternating current (AC) circuits, components, and terminology. It covers AC generators, their operation, and different types, along with AC motors used in machinery. This part also explores the role of transformers in power transmission and control systems, emphasizing the importance of understanding their functions in modern facilities.

Part III describes the various types of DC sources. It also explains the relevant DC circuit terminology. It demonstrates a series of basic DC circuit calculations by providing pertinent examples. It also introduces conventional and electron flow and voltage polarity as well as defines Kirchhoff's Laws. Finally, it discusses DC circuit analysis and faults.

Part IV explores electrical hazards and fundamental safety practices. It highlights risks associated with power tools and electrical circuits, especially in workplaces where hazards are greater. This part prepares learners for further safety training, covering key definitions, best practices, and real-life case studies of electrical incidents.

This online interactive presentation is intended for electricians as well as other technical personnel who are interested in learning about the fundamentals of electrical power system and electrical safety.



Learning Objectives

This continuing education interactive presentation is intended to provide you with the following specific knowledge and skills:

Learning Objectives of Part I:

- > Familiarizing with the construction and operation of a simple AC generator
- > Understanding the development of a sine-wave output in an AC generator
- > Learning about inductive and capacitive reactance and impedance in a circuit
- Understanding the effect of the phase relationship between current and voltage in circuits
- > Understanding phasor diagrams representing AC current and voltage in circuits
- > Calculating the inductive and capacitive reactance and impedance of different circuits
- > Learning about resonance, resonant frequency and the net reactance of a circuit
- Understanding the relationship between apparent, true, and reactive power by definition or by using a power triangle
- > Gaining an overview of three-phase power systems used in the industry

Learning Objectives of Part II:

- > Familiarizing with the components, theory and operation of an AC generator
- Understanding the role of voltage regulation equipment and the function of each of their components
- Learning about the theory, terminology and the application of the different types of AC motors
- Learning about the theory, terminology and the application of the different types of transformers
- > Knowing how to perform calculations of various electrical parameters

Learning Objectives of Part III:

- Identifying DC sources
- > Familiarizing with DC circuit terminology
- > Performing DC circuit calculations
- > Understanding voltage polarity and current direction
- Learning about Kirchhoff's laws
- > Analyzing DC circuits and identifying circuit faults



Learning Objectives of Part IV:

- > Understanding the causes of an electrical shock
- > Describing the dangers caused by an electric shock
- > Describing the various electrical hazards
- > Learning skills that help you recognize, evaluate, and control electrical hazards
- > Preparing you for additional safety training such as hands-on exercises
- > Providing detailed reviews of regulations for electrical work
- > Learning safe practices and developing good safety habits

Course Document

For this course, you will need to watch the interactive presentation titled, "Exploring Electrical Systems: AC, DC, and Safety". To access the interactive presentation, you will need to login or register and purchase the course. Following the course purchase, please click on the link provided in your account history to view the interactive presentation. The duration of the interactive presentation is approximately 316 minutes including the knowledge check and course quiz questions.

Course Quiz

Once you finish watching this interactive presentation, you will be redirected to your account to take a multiple-choice quiz consisting of twenty (20) questions to earn 4 credit hours. The quiz will be based on this interactive presentation. The minimum passing score is 70%. There is no time limit on the quiz, and you can take it multiple times until you pass at no additional cost.

Certificate of Completion

Upon successful completion of the quiz, please print your Certificate of Completion instantly. (Note: if you are paying by check or money order, you may print your Certificate of Completion after we receive your payment.) For your convenience, we will also email you your Certificate of Completion. Also, you can log in to your account at any time to access and print your Certificate of Completion.