

## **EPEC Lighting Module 1: Introduction to Electrical Products**

### **Objectives**

Upon completion of this module, you will be able to:

- Recognize how knowledge of a broad range of electrical products and how they interrelate in electrical systems will translate into many professional advantages.
- Identify basic electrical terms, functions, and relationships.
- Recognize the EPEC Electrical Products Triangle – a concept you can use to uncover product sales opportunities throughout an electrical system, no matter what the project or installation may be.
- Identify all the considerations—in addition to a product’s price—that play a part in the product selection process.
- Practice analyzing sample plans and specifications to look for sales opportunities.

### **Chapter Outline**

Chapter One: Expanding Your Opportunities in Electrical Distribution

- A. Your Role in, and Contribution to, the Electrical Industry
- B. The EPEC Opportunity

Chapter Two: The Basics of Electricity

- A. Electricity: The Source
- B. Flow, Force, and Resistance in Electric Current
- C. Circuits and Related Terms
- D. The Relationships of Amperes, Volts, Ohms, and Watts

Chapter Three: The EPEC Electrical Products Triangle

- A. Loads: Light, Heat, Power, Communications, and Receptacles
- B. Controls
- C. Distribution System and Physical Protection
- D. Electrical Protection
- E. Service Entrance
- F. Fittings, Boxes, and Supplies
- G. Tools and Instruments

Chapter Four: Considerations for Product Selection

- A. Product Selection Variables
- B. Industry Influences

Chapter Five: Product Selection Application

- A. From Ideas to Reality
- B. Choices and Trade-Offs in Product Selection

Chapter Six: EPEC Assignment

- A. EPEC Electrical System: The Guardhouse
- B. EPEC Assignment

## **EPEC Lighting Module 2: Lighting Basics**

### **Objectives**

Upon completion of this module, you will be able to:

- Understand the definition of light.
- Explain the basics of vision.
- Recognize lighting metrics.
- Understand the definition color.
- Explain correlated color temperature (CCT).
- Define the color rendering index (CRI).

### **Chapter Outline**

Chapter One: Basics of Light & Seeing

- A. What is Light?
- B. Vision Basics
- C. Lighting Metrics

Chapter Two: Color & Light

- A. What is Color?
- B. Color Rendering Index
- C. Correlated Color Temperature
- D. Understanding Differences of CRI & CCI

Chapter Three: EPEC Assignment

- A. EPEC Electrical System: Single-Family Residence
- B. EPEC Assignment

## **EPEC Lighting Module 3: Lighting Sources & Ballasts**

### **Objectives**

Upon completion of this module, you will be able to:

- Recognize how light sources differ.
- Be familiar with the different lamp families.
- Understand how light sources work.
- Identify the different types of incandescent lamps.
- Be aware of the features of dimming.
- Comprehend how a fluorescent lamp works.
- Classify the different types of fluorescent lamps.
- Be familiar with ballasts and their functions.
- Recognize the specific features of high-intensity discharge lamps.
- Understand the benefits of low-pressure sodium lamps and ballasts.
- Name the features and benefits of light-emitting diode (LED) lamps.

### **Chapter Outline**

#### Chapter One: Light Sources

- A. How are They Different?
- B. Lamp Families

#### Chapter Two: Incandescent Lamps

- A. What is a Light Bulb?
- B. Types of Incandescent Lamps

#### Chapter Three: Fluorescent Lamps

- A. How Do Fluorescent Lamps Work?
- B. Types of Fluorescent Lamps
- C. Fluorescent Ballasts

#### Chapter Four: HID Lamps

- A. High-Intensity Discharge (HID)
- B. Low-Pressure Sodium
- C. Ballasts & Starters

#### Chapter Five: Light-Emitting Diodes (LEDs)

- A. LED Characteristics
- B. How LEDs Work
- C. Applications
- D. Advantages and Disadvantages

#### Chapter Six: EPEC Assignment

- A. EPEC Electrical System: Cabinet Maker Shop
- B. EPEC Assignment

## **EPEC Lighting Module 4: Luminaires & Calculations**

### **Objectives**

Upon completion of this module, you will be able to:

- Recognize the four major ways to control light.
- Be familiar with the two major luminaire classifications.
- Understand the various secondary classifications.
- Identify the classification based on distribution types.

### **Chapter Outline**

Chapter One: What's a Luminaire?

- A. Concepts of Lighting Control
- B. Luminaire Classifications
- C. Luminaire Mounting Methods

Chapter Two: Outdoor Luminaire Characteristics

- A. Luminaire Types
- B. Roadway Lighting Distribution Types
- C. Lighting for Highlights and Shadows

Chapter Three: Photometry and Lighting Calculations

- A. Photometry
- B. Lighting Calculations

Chapter Four: EPEC Assignment

- A. EPEC Electrical System: The Condominium Lighting Project
- B. EPEC Assignment

## **EPEC Lighting Module 5: Lighting Applications & Energy Management**

### **Objectives**

Upon completion of this module, you will be able to:

- Identify home lighting applications.
- Name several lighting methods to sell and enhance products in a retail setting.
- Understand the variables, considerations, and visual comfort in an office setting.
- Distinguish key factors in functions, comfort, and design for outdoor lighting applications.
- Evaluate light distribution and spacing criteria factors in a warehouse lighting design.
- Assess industrial environmental settings for lighting solutions.
- Estimate costs of commercial buildings and propose lighting controls to play an important part in cost reduction.
- Judge reasons for incorporating daylight into the lighting scheme of a building and how it's an important element of sustainable design.
- Apply principles of capital investment to lighting design evaluation.
- Understand the need to consider the limitations and requirements of energy codes on all lighting.

### **Chapter Outline**

Chapter One: Residential

- A. Lighting Design for Home Spaces

Chapter Two: Retail Lighting

Chapter Three: Office Lighting

Chapter Four: Warehouse Applications

Chapter Five: Industrial Applications

- A. Economics of Quality Industrial Lighting
- B. Industrial Lighting Design Considerations
- C. Industrial Environments
- D. Task Lighting
- E. Hazardous Locations

Chapter Six: Outdoor Lighting Applications and Design

- A. Outdoor Lighting Considerations
- B. Outdoor Lighting Design
- C. Sports Lighting

Chapter Seven: Energy Management

- A. Controls
- B. Daylighting
- C. Sustainable Building Design

Chapter Eight: Lighting Management

Chapter Nine: EPEC Assignment

- A. EPEC Electrical System: Energy Management
- B. EPEC Assignment

## **EPEC Lighting: Final Exam**

This exam presents 100 random questions based on the content presented in Lighting Modules 1 through 5. There is no time limit for this exam, and you need to score 75% or higher to pass.

## **EPEC Lighting: Capstone Project**

### **Objectives**

Upon completion of this module, you will be able to:

- Review plans and specifications.
- Create a bill of materials for the products selected.
- Determine the best product for each application.
- Develop a cut package of all selected products including related items from the EPEC Triangle.
- Consider product selection variables and trade-offs.

### **Chapter Outline**

- A. EPEC Electrical System: Department Store and Amusement Park
- B. EPEC Capstone Project