

# Electrical Print Reading – ANSI

4 Days, 3.2 CEUs

An electrical print, schematic or diagram is a map that represents the layout of various types of electrical systems. Knowing how to read these electrical drawings is critical when performing acceptance of new equipment and in troubleshooting existing equipment. There are many types of prints that utilize hundreds of symbols established by ANSI or the IEC.

This course provides instructions and exercises in the proper use of these documents. Equipment application, troubleshooting, and print revision methods to correctly reflect equipment changes will be demonstrated. Course participants will be shown how to identify symbols and how to unravel this common language for electrical equipment.

## Who Should Attend

This hands-on course is intended for new or experienced electricians and technicians that install, maintain, repair or troubleshoot power and auxiliary systems. The participant should have basic knowledge of power system components.

## Learning Objectives:

Upon completion of this course and lab practice, the participant will demonstrate by attaining a minimum average of 80% (between lab and final exam), that he/she is able to:

- Explain the fundamentals of Electrical Drawing
- Demonstrate the application of single-line, elementary, schematic, and wiring diagrams (wireless and wired), as well as functional control diagrams
- Interpret common ANSI symbols used in utility and industrial applications
- Demonstrate troubleshooting techniques utilizing schematic diagrams
- Develop wiring diagrams from schematics

## SCOPE

### Day 1\*

- I. **Introduction**
  - A. Schedule
  - B. Course Outline
- II. **Electrical Drawing Fundamentals**
  - A. Types of Diagrams
  - B. Elementary Diagrams and Schematics
  - C. Wiring Diagrams
  - D. Block Diagrams
  - E. Functional Control Diagrams (FCDs)
  - F. Conduits, Raceways, and Grounding
  - G. Drawing Standards
  - H. Drawing Classification Systems
  - I. Changes
  - J. Lab (1 Hour)
    1. Identifying Electrical Symbols

### Day 2

- III. **Single-Line Diagrams**
  - A. Purpose of Single-Line Diagrams
  - B. Types of Single-Line Diagrams
  - C. Common Symbols and Abbreviations
  - D. Single-Line Diagrams
  - E. Power Transformers
  - F. Interpreting the Single-Line Diagram
  - G. 20 MVA Transformer To Outdoor Switchgear – Bus 2

### Day 3

- IV. **Elementary Diagrams**
  - A. Purpose
  - B. Symbols and Abbreviations
  - C. Interpretation of Diagrams
- V. **Wiring Diagrams**
  - A. Purpose
  - B. Types of Single-Line Diagrams
  - C. Symbols, Abbreviations, and Device Numbers
  - D. Interpretation of Wiring Diagrams
  - E. Lab (3 Hours)
    1. Elementary Diagram Exercises

### Day 4

- VI. **Functional Control Diagrams**
  - A. Definition
  - B. Purpose
  - C. Applications of the FCD
  - D. Advantages of FCD
  - E. Logic Symbols
  - F. Interpreting the FCD
  - G. Lab (2 Hours)
    1. Wiring Components According to the Elementary Diagram
- VII. **Final review and exam**

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

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