

# ELC-115 Industrial Wiring

## COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course covers layout, planning, and installation of wiring systems in industrial facilities. Emphasis is on industrial wiring methods and materials. Upon completion, students should be able to install industrial systems and equipment. Course Hours Per Week: Class, 2. Lab, 6. Semester Hours Credit, 4.

## LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Identify and demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course.
2. Demonstrate appropriate use of test equipment, evaluate circuit performance and apply appropriate troubleshooting techniques to industrial electrical circuits.
3. Properly install electrical devices in commercial and industrial installations according to the requirements of the National Electrical Code.
4. Identify, size, and install wiring and electrical distribution equipment and devices associated with industrial electrical installations in accordance with the National Electric Code.
5. Learn how to bend conduit using a manual conduit bender.
6. Learn how to read working drawings.
7. Recognize and demonstrate appropriate use of tools and materials that are used in industrial wiring.

## OUTLINE OF INSTRUCTION:

- I. Safety
  - A. Electrical
  - B. Mechanical
- II. Construction plans and specifications
  - A. Commercial
  - B. Industrial
- III. Substations
  - A. Transformers
    1. Single Phase
    2. Three Phase
    3. Transformer Banks
    4. Transformer Vaults
  - B. High voltage section
  - C. Low voltage section
  - D. Metering equipment
- IV. Electrical services for commercial and industrial buildings
  - A. Conductor and raceway sizing
  - B. Grounding

- V. Branch circuits and feeders
  - A. Load computation
  - B. Feeder bus systems
  - C. Conductor and raceway sizing
  - D. Installations
  
- VI. Low voltage controls
  - A. Remote controlled lighting
  - B. Alarm systems
  - C. Signaling systems
  - D. Installation methods
  
- VII. Switch control of lighting circuits
  - A. Circuit diagrams
  - B. Installations
  
- VIII. Appliance circuits
  - A. Branch circuit requirements
  - B. Installations
  - C. Control and protection
  
- IX. Heating and cooling systems
  - A. Protection & control of electric heating and cooling equipment
  - B. Installations
  - C. NEC requirements
  
- X. Special systems
  - A. Special equipment
  - B. Communication systems
  - C. Conduit systems
  - D. Grounding
  
- XI. Industrial lighting
  - A. Incandescent fixtures
  - B. Fluorescent fixtures
  - C. High intensity discharge systems
    - 1. Low pressure sodium
    - 2. High pressure sodium
    - 3. Metal halide
  - D. Installations
  
- XII. Emergency power systems
  - A. Circuit wiring
  - B. Circuits for lighting and power
  
- XIII. Overcurrent protection devices
  - A. Fuses
  - B. Circuit breakers
  
- XIV. Hazardous locations
  - A. Class I locations

- B. Class II locations
- C. Class III locations

**REQUIRED TEXTBOOK AND MATERIAL:**

The textbook and other instructional material will be determined by the instructor.