I. **COURSE TITLE:** Basic Electrical

II. **NUMBER OF HOURS:** 56  
   Lec. Hrs: 30  
   Lab Hrs: 26

III. **NUMBER OF SESSION DAYS:** 7

IV. **GENERAL COURSE DESCRIPTION:**

This course is designed to give the student a fundamental knowledge of AC and DC electricity, basic circuitry, and their relationships to electrical wiring systems used in commercial and industrial locations. The prime focus of this training is to provide the foundations and experience with electrical circuitry to enable the student to safely maintain and troubleshoot industrial wiring systems.

V. **COURSE OBJECTIVES:**

Upon completion of this course the student will:
1. List the four components of electricity and state their relationships.
2. List the five components of a basic circuit and state the functions of each.
3. Given a schematic diagram, identify the type of circuit, give the operational characteristics of each type (Series, parallel, and combination), and build the circuit on an electrical trainer.
4. Understand the principles of magnetism and how it relates to the production of electricity and the basic operation of motors, transformers and relays.
5. Safely troubleshoot a basic series, parallel and series/parallel circuit.
6. Understand the basics of AC resistive, capacitive and inductive circuits.

VI. **PREREQUISITES:**

The student must have successfully completed the Industrial Electricity Safety course.

VII. **LEARNING OUTCOMES:**

The student will understand what electricity is and how it behaves in electrical circuitry. This knowledge will provide the basic building blocks in mastery of electrical circuitry used in commercial and industrial systems. Upon completion of any specific lecture and or subject, the student will complete a written exam and or practical project. The student will spend approximately 50% of the time in lecture and 50% of the time completing projects. Students will be evaluated on accuracy and correct operation of their circuitry.

VIII. **MATERIALS/FACILITIES NEEDED:**

Classroom with tables and chairs for each student  
Computer and Datapoint presentation device.  
Electrical trainers with electrical components  
Combination TV/VCR
IX. COURSE OUTLINE.

A. Introduction to Industrial Electricity:
   1. Atomic Structure of Matter.
   2. Electrical Quantities:
      a. Volts
      b. Amperes
      c. Resistance
      d. Power
   3. Ohm’s Law

B. Basic Electrical Circuits:
   1. The Basic Circuit
   2. Resistors
      a. Types and Construction
      b. Schematic Symbols
      c. Color Code
   3. Series Circuits
   4. Parallel Circuits
   5. Combination Circuits

C. Magnetism:
   1. Electron Theory of Magnetism
   2. Magnetic Induction
   3. Magnetic Devices

D. Alternating Current
   1. Resistive Circuits
   2. Capacitive Circuits
   3. Inductive Circuits

E. Basic Fuse and Circuit Breaker Theory.
   1. Fuse Types and ratings
   2. Circuit breaker types and ratings.
   3. Trip causes.

X. COURSE EVALUATION:

A course evaluation will be distributed to obtain the students reaction to the course.