COURSE INFORMATION FORM

DISCIPLINE  INTE
COURSE TITLE Industrial Electrical Principles
CR.HR  4  LECT HR.  2  LAB HR.  4  CLIN/INTERN HR.  CLOCK HR.

CATALOG DESCRIPTION

This course is an introductory course for the individual who is moving into an industrial maintenance or related activity. Behavior of electricity, sources of electricity, Ohms’ and Watt’s laws, electrical power distribution, transformers, electrical safety, electrical measurements and basic components are covered.

PREREQUISITES

Completion of or concurrent enrollment in MATH 103R or higher.

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

Upon completion of this course, the student will be able to:
1. Describe and apply safe practices around electricity.
2. Describe the sources and behavior of electricity.
3. Describe precautions to be practiced when working with electricity.
4. Operate standard test equipment such as meters, oscilloscopes, function generators and frequency counters.
5. Demonstrate an understanding of the use of metric notation in electronics work.
6. Apply Ohm’s Law and Watt’s Law.
7. Describe electrical distribution principles.
8. Wire basic electric lighting circuits.
9. Test and evaluate electrical components such as resistors, capacitors and coils.
10. Determine power factor of circuits.
12. Determine voltage, current and resistance values in a parallel circuit.

GENERAL EDUCATION OUTCOMES (ESO)

Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

Quantitative Literacy and Mathematical Analysis

G. Apply mathematical models to solve problems and draw conclusions (6, 11-13)
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The students will demonstrate:
1. the ability to think critically and apply problem-solving skills.
2. the ability to apply foundational skills in an industrial setting, safely and to industry guidelines.
3. the ability to exhibit competence in the entry-level skills of a technical profession in Industrial Technology.
4. the ability to exhibit competence in the entry-level skills of Programmable Logic Controllers.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

Written examinations (1 - 13)

Project (4, 6, 8)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Electrical Safety
II. Test Equipment Familiarization
   A. Multimeters – Analog and Digital
   B. Oscilloscopes
   C. Function Generators
   D. Frequency Counters
   E. Tools
III. Basic Electronic Theory
    A. Metric Notation
    B. Voltage and Current
    C. Ohm’s Law and Watt’s Law
IV. Measurements
    A. Voltage
    B. Current
    C. Resistance
V. Electronic Components
    A. Resistors
    B. Switches, Fuses and Breakers
    C. Magnetism, Relays and Meters
    D. Capacitors
    E. Inductors
    F. Transformers
VI. Circuits
    A. Series
    B. Parallel
    C. Series – Parallel
    D. Basic DC
VII. Reactive devices
     A. Capacitors
     B. Coils
VIII. Power factor