University of Arkansas - Fort Smith
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General Syllabus

ELEC 1263 Industrial Electricity

Credit Hours: 3 Lecture Hours: 2 Laboratory Hours: 2

Prerequisite: ELEC 1233 Fundamentals of Electricity

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Fundamentals of motors and motor control. Includes switches, relays, transformers, three-phase power systems, DC motors, single-phase motors, three-phase motors, overload protection and motor controllers. The National Electrical Code standards for all circuits are emphasized.

B. Additional Information

The course is designed to complement ELEC 1233 Fundamentals of Electricity by providing theory and lab experience in the electrical maintenance area. Emphasis is given to practical applications by "hands-on" lab experience. Safety and good workmanship are stressed.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Interpret AC motor and transformer wiring diagrams.
2. Interpret ladder diagrams and control circuitry.
3. Interpret NEMA motor nameplate wiring diagrams.
4. Specify wire gauge and circuit breaker size in accordance with NEC Code Book.
5. Without nicking the wire or shearing strands, strip and properly terminate wire connections to power and control circuits.
6. Wire 220 VAC service entrance and 2W and 3W switch circuits without errors.
7. Without errors, wire delta and wye connections to motor and transformer circuits.

8. Correctly wire relays, timers, motor contactors and heater circuits.
9. With all essential details, describe the proper first aid procedures to follow for treatment of electric shock.
10. Demonstrate awareness of safety rules for AC line powered equipment by following prescribed troubleshooting procedures.
11. Locate and repair faults in AC and DC motors and motor control circuits.
12. Locate and repair faults in ladder diagram and relay logic control circuits.
13. Recall safe wiring techniques for residential and industrial power distribution wiring in accordance with prescribed industry standards.
14. Demonstrate safe wiring practices for single/three phase motor control and motor speed circuits using the industrial electronics trainer.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking - Students will analyze and troubleshoot AC and DC motors, motor control circuits, ladder diagrams, and relay logic control circuits. Students will justify the proper analytical troubleshooting techniques to determine faults in motors and circuits in the laboratory.

Quantitative Reasoning - Students will utilize mathematics to solve various electrical problems.

III. Major Course Topics

A. Definitions
B. Symbols and components
C. Safety
D. Residential wiring
E. DC motors
F. DC generators
G. DC motor controls
H. AC generator
I. Transformers
J. Electrical distribution
K. AC motors
L. AC motor controls
M. Ladder diagrams
N. NEC