

ELC-117 Motors and Controls

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course introduces the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. Upon completion, students should be able to properly select, connect, and troubleshoot motors and control circuits. 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. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course.
2. Understand the purpose of lockout/tagout.
3. Demonstrate appropriate use of test equipment, evaluate circuit performance and apply appropriate troubleshooting techniques to control circuits and motor operation.
4. Design ladder diagram circuits.
5. Interpret and use ladder and wiring diagrams, symbols, and schematics.
6. Demonstrate and describe the use of relays, contactors, motor starters, and pilot devices in electrical control circuits.
7. Successfully wire and debug ladder logic wiring diagrams.

OUTLINE OF INSTRUCTION:

- I. Symbols and diagrams
 - A. Electrical diagram symbols
 - B. Ladder logic diagrams
 - C. Wiring diagrams
- II. Basic control circuits
 - A. Two wire control
 - B. Three wire control
 - C. Sequence control
- III. Manual motor starters
 - A. Construction and operation
 - B. Applications
- IV. Solenoids
 - A. Types
 - B. Applications
- V. AC and DC contactors and starters
 - A. Construction
 - B. Rules of application

- C. Non-reversing controls
- D. Reversing and multiple speed controls
- E. Reduced voltage starting
- F. Accelerating and decelerating controls

VI. Time delay circuits

- A. Types of timers
- B. Applications

REQUIRED TEXTBOOK AND MATERIAL:

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