ELM 2201: AC/DC Motor Control 1

A. COURSE DESCRIPTION

Credits: 5
Lecture Hours/Week: 2
Lab Hours/Week: 3

Prerequisites:
This course requires the following prerequisite
   ELM 1102 - AC Electrical & Electronic Theory & Application

AC/DC Motor Control 1 covers the function, operation, installation, protection, maintenance and troubleshooting of motor controls, various starting circuits and motors according to applicable National Electrical Code articles.

B. COURSE EFFECTIVE DATES: 03/19/2003 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Safety
2. Electrical quantities and circuits
3. Tools
4. Instruments
   A. Multimeters
   B. Clamp-on ammeters
   C. Meggers
   D. Scopemeters
5. Logic applied to line diagrams
6. Electrical symbols and line diagrams
7. Manual contactors
8. Magnetism and magnetic solenoids
9. AC/DC contactors and motor starters
   A. Overloads
   B. Methods of protection
10. Electromechanical and solid-state relays
11. Time delay and logic
12. Control devices
13. Reversing motor circuits
   A. Pushbutton interlocks
   B. Electrical interlocks
   C. Mechanical interlocks
14. Braking and plugging circuits

D. LEARNING OUTCOMES (General)

1. Students will identify and use tools used by electricians for motor control circuits.
2. Students will illustrate knowledge of prints and symbols used in motor control circuits.
3. Students will show understanding of basic parts of motor control systems.
4. Students will use diagrams to wire motor control circuits.
5. Students will design a control system for a given situation.
6. Students will demonstrate understanding of reversing motor circuit.
7. Students will demonstrate knowledge of timing circuits.
8. Students will understand components used in motor control systems.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   HCC COMPETENCIES MET:
   Working Productively and Cooperatively
   Communicating Clearly and Effectively
   Thinking Creatively and Critically
   Social / Civic Responsibility

   STUDENT CONTRIBUTIONS:
   The student is expected to read the required textbook, spend sufficient time outside of class to complete assignments, submit assignments when due, take tests on scheduled dates, participate in class discussions.

   STUDENT ASSESSMENT SHALL TAKE PLACE USING INSTRUMENTS SELECTED/DEVELOPED BY THE COURSE

   INSTRUCTOR. SPECIAL INFORMATION: ELM 2201 requires students to maintain a minimum 95% attendance. Attendance below 95% may be made up by completing a 1-credit class. The 1-credit class will equal three days of absence. This credit must be pre-approved by the course instructor. Three less than full days (tardy or leaving early) will equal a full day absence. Attendance of less than 95% and not taking the 1-credit makeup class will result in retaking the course.

AASC APPROVAL DATE:  October 25, 2017
REVIEW DATE:  October 2022