MECH 1610: Basic Industrial Controls

A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: 1
Lab Hours/Week: 2
OJT Hours/Week: *.*
Prerequisites: None
Corequisites: None
MnTC Goals: None

This course introduces students to industrial control components and systems. Digital industrial electrical devices such as switches, sensors, relays and motor starters are used in hands on labs. 3Ø motors and Variable Frequency Drives (VFDs) are also covered. Ladder diagrams will be a focus of this course and students will use equipment manuals and diagrams to build industrial electrical circuits. Students will also be introduced to residential electrical wiring. (Corequisite: None) (3 Credits: 1 lecture/2 lab)

B. COURSE EFFECTIVE DATES: 01/13/2020 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Interpreting Ladder Diagrams
2. Drawing Ladder Diagrams
3. Building Industrial Control Circuits
4. Apply Motor Protection to a Three Phase Motor
5. Control a Three Phase Motor With a VFD
D. LEARNING OUTCOMES (General)
   1. Explore ladder diagrams
   2. Create ladder diagrams
   3. Investigate electrical pilot devices
   4. Draw circuits with lights and switches.
   5. Build circuits with lights and switches.
   6. Investigate timing and non-timing relays
   7. Draw circuits with relays and timing relays.
   8. Build circuits with relays and timing relays.
   9. Explore digital sensors and switches
  10. Draw circuits with photoelectric and proximity switches.
  11. Build circuits with photoelectric and proximity switches.
  15. Build circuits with a 3Ø motor.
  16. Explore VFDS
  17. Draw circuits with a VFD.
  18. Build circuits with a VFD.
  19. Explore Basic residential electrical wiring
  20. Construct a basic residential outlet electrical circuit.
  21. Construct a basic residential lighting control electrical circuit.

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

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted