Minnesota State College Southeast

MECH 1620: Programmable Controllers

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 1

Lab Hours/Week: 4

OJT Hours/Week: *.*

Prerequisites:
This course requires the following prerequisite
    MECH 1610 - Basic Industrial Controls

Corequisites: None

MnTC Goals: None

This course covers the operation of Programmable Logic Controllers (PLC). The hardware and software aspects of the PLC will be explored. Basic communication between the PC, PLC and Human Machine Interface (HMI) will be covered. Ladder logic instructions including; bit instructions, timers, counters, bit shifting, and sequencer instructions will be covered. Additionally, discrete and modular I/O integration will be applied to basic programs. HMI development and basic HMI applications will be developed and demonstrated. (Prerequisite: MECH1610 Basic Industrial Controls) (3 Credits: 1 lecture/2 lab)

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

C. OUTLINE OF MAJOR CONTENT AREAS

1. Analyze PLC Communications
2. Analyze Ladder Logic
3. Write PLC programs
4. Wire PLC Circuits
5. Write HMI Programs

D. LEARNING OUTCOMES (General)

1. Describe Programmable Logic Controllers (PLC)
2. Identify PLC programming devices
3. Utilize PLC memory structure
4. Describe PLC memory and addressing in a RSLogix 500 system
5. Apply I/O addresses to external devices
6. Apply memory addresses for programming
7. Describe Ladder Logic instructions
8. Design Ladder Logic utilizing bit instructions
9. Design Ladder Logic utilizing timer/counter instructions
10. Design Ladder Logic utilizing comparison instructions
11. Design Ladder Logic utilizing data manipulation instructions
12. Design Ladder Logic utilizing word level (16 bit) instructions
13. Analyze ladder logic
14. Utilize PLC program troubleshooting procedures
15. Describe PLC wiring practices
16. Apply I/O wiring for PLC control
17. Utilize discreet I/O
18. Utilize PLC modules
19. Troubleshoot PLC wiring
20. Describe HMI systems and programming for PLC systems
21. Develop Human-Machine (HMI) communications for PLC systems
22. HMI program development and implementation
23. Troubleshoot HMI communications
24. Troubleshoot HMI programming

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted