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 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. (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