A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: *. *
Lab Hours/Week: 6
OJT Hours/Week: *. *

Prerequisites:
MFGT 2550 - Programmable Logic Controls
Corequisites: None
MnTC Goals: None

This course provides learners with practical hands-on experience with programmable logic controllers (PLCs). The lab combines computer based simulation with real lab application. Prerequisite: MFGT2550.

B. COURSE EFFECTIVE DATES: 12/22/1997 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Demonstrate of PLC hardware knowledge.
2. Recognize various forms of I/O modules and devices.
3. Implement basic numbering systems operations in a PLC.
4. Organize PLC memory architecture.
5. Program basic PLC instructions.
6. Program PLC timers and counters.
7. Program basic logic and data operations.
8. Create basic data visualizations.
9. Configure selected industrial network protocols.
D. LEARNING OUTCOMES (General)

1. The learner will gain an understanding of general automation project design. This will include a familiarity with and application of Good Automated Manufacturing Practices (GAMP). An automation client will be interviewed and a User Requirement Specification will be developed.

2. The learner will examine a lab-based Flexible Manufacturing System (FMS) and a project development plan will be create for that system. This plan will include the entire GAMP design process and will include the following:
   - User Requirement Specification
   - Functional Specification
   - Design Specification
   - Installation Qualification
   - Operational Qualification
   - Performance Qualification

   The learner will be introduced to the application of state-based automation using the FMS system.

3. gain understanding of the change proposal & implementation process for validated automated systems. This will be gained through development of a change proposal for the Flexible Manufacturing System (FMS). This proposal will outline a system limitation & propose specific change steps, document expected change impact on the validated system, implement the change & document results in comparison with expectations. Change proposals will focus on software enhancements & will serve as an introduction to the advantages of Object Oriented Programming (OOP) as applied to validated automation systems.

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

   None

F. LEARNER OUTCOMES ASSESSMENT

   As noted on course syllabus

G. SPECIAL INFORMATION

   None noted