

# Minnesota State College Southeast

## MECH 1630: Advanced PLC Programming

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 1

Lab Hours/Week: 4

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

MECH 1620 - Programmable Controllers

Corequisites: None

MnTC Goals: None

This course introduces students to Studio 5000 software and Controllers. Students will utilize tag based programming to create ladder logic program for industrial programming. Function block programming and structured text programming will also be introduced and applied. (Prerequisite: MECH1620) (3 Credits: 1 lecture/2 lab)

**B. COURSE EFFECTIVE DATES:** 05/12/2020 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Studio 5000 Structure & Layout
2. Ladder Logic Programming
3. Function Block Programming
4. Structured Text Programming

#### **D. LEARNING OUTCOMES (General)**

1. Commission a Studio 5000 programmed PLC
2. Identify layer one components to communicate
3. Install the layer one components to communicate
4. Identify and utilized needed drivers
5. Configure device addresses
6. Explore tag addressing
7. Create a project
8. Create tags
9. Create tasks
10. Create programs
11. Create routines
12. Program XIO & XIC commands
13. Program OTE, OTL and OTU commands
14. Program the One Shot, and MOV and MVM commands
15. Program Timers, Counters and Subroutines
16. Program Math, Comparison, and sequencing instructions
17. Program `IF THEN` statements
18. Program `ELSIF` statements
19. Program assignment statements
20. Program arithmetic operators and combination logic
21. Program Boolean Function Block (FB) instructions
22. Program FB Timers
23. Program FB Counters
24. Program FB Math instructions
25. Utilize IREFs, OREFs, OCONs, and ICONs.
26. Utilize multiple sheets
27. Troubleshoot all programming
28. Correct all 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