MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

Faculty is required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. MECH COURSE NUMBER: 2136

NUMBER OF CREDITS: 3 credits (2 lect., 1 lab)

COURSE TITLE: Programmable Logic Controllers

CATALOG DESCRIPTION: Demonstrates use of plc and circuits to control and power all phases of industrial automation.

AUDIENCE: Mechatronics students

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Area: by meeting the following competencies:
Area: by meeting the following competencies:
Area: by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:
MECH1125 and MECH1135

LENGTH OF COURSE: 1 Semester

THIS COURSE IS USUALLY OFFERED:
Every other year ☐ fall ☐ spring ☑ summer ☐ undetermined ☐

Four goals are emphasized in course at Minnesota West Community & Technical College:

ACADEMIC CONTENT: The academic objectives of this course are:
Demonstrating the knowledge of programmable logic controller installation, programming, wiring, and applications.

THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
Performing tests with an examination (or discussion) of the rationale for each test.

COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
a. Participating in class discussions and reports  
b. Participating in assignments, worksheets, and reports  

HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:  
a. Participating in classroom discussions  
b. Working with other students on research activities  
c. Working with students from other cultures  

TOPICS TO BE COVERED:  
1. Basic PLC theory  
2. Analog and digital theory  
3. PLC hardware  
4. PLC programming  
5. PLC and system interfacing  
6. PLC installation and startup procedures  
7. PLC maintenance  
8. Troubleshooting principles and testing for hardware and software  

COURSE LEARNING OUTCOMES (GENERAL):  
1. Identify various PLC hardware components, communication interfaces, and associated I/O field devices.  
2. Design PLC logic circuits.  
3. Demonstrate the function and operation of PLC's.  
4. Design, wire, program, troubleshoot, and operate PLC's.  

STUDENT LEARNING OUTCOMES (SPECIFIC):  
1. Describe PLC industry function  
2. Describe PLC program methods  
3. Program ladder logic circuits  
4. Describe various mfg hardwire layout  
5. Program with bits, timers, counters  
6. Program with sequencers  
7. Program discrete PLC I/O  
8. Wire various I/O field devices  
9. Troubleshoot PLC wiring and programming logic
LEARNING/TEACHING TECHNIQUES used in the course are:

- Collaborative Learning
- Student Presentations
- Creative Projects
- Lecture
- Demonstrations
- Lab
- Problem Solving
- Interactive Lectures
- Individual Coaching
- Films/Videos/Slides
- Other (describe below)

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- Reading
- Oral Presentations
- Textbook Problems
- Group Problems
- Other (describe below)
- Tests
- Worksheets
- Papers
- Term Paper
- Individual Projects
- Collaborative Projects
- Portfolio
- Lab

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

The information in this course outline is subject to revision

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or via your preferred Telecommunications Relay Service.

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Revised 10/1/16