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: 2120

NUMBER OF CREDITS: 5 credits (2 Lecture and 3 Lab)

COURSE TITLE: Automated Systems

CATALOG DESCRIPTION:
Provides students with an understanding of and the ability to use programmable logic controllers, human machine interfaces, drives, controllers, and other hardware 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, MECH1135, MECH2136

LENGTH OF COURSE: 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:

1) ACADEMIC CONTENT: The academic objectives of this course are:

   The student will acquire the knowledge and skills needed to: design, wire, program, and troubleshoot various PLC’s, drives, controllers, and interfaces used in an automated environment.

2) THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:

   a. Completing homework (reading, labs, and worksheets)
b. Participating in classroom discussions and activities
c. Taking open and closed book quizzes and tests
d. Design, wire, and troubleshoot automation circuits

3) 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

4) 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 and lab activities
   c. Working with students from other cultures

TOPICS TO BE COVERED:
1. Controller, drive, and interface theory
2. Hardware
3. Programming
4. Automated system interfacing and communications
5. Controller, drive, and interface installation and startup procedures
6. Advanced control circuits
7. Operator interfaces
8. Troubleshooting principles and testing for hardware and software

COURSE LEARNING OUTCOMES (GENERAL):
1. Identify various controller, drive, and interface hardware components, communication interfaces, and associated I/O field devices.
2. Understanding of the function and operation of PLC’s, drives, controllers, and interfaces.
3. Apply skills in designing, wiring, programming, troubleshooting, and operation of automated systems.

STUDENT LEARNING OUTCOMES (SPECIFIC):
1. Understanding of controller, drive, interface, and software theory
2. Identify hardware components for equipment used in an automated system
3. Demonstrate the ability to wire hardware components
4. Create programs using various software platforms
5. Install and configure drivers used to establish communications to hardware
6. Perform hardware configurations
7. Design logic programs to control industrial equipment and processes
8. Troubleshoot hardware and software issues that arise in automated systems
LEARNING/TEACHING TECHNIQUES used in the course are:

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

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

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

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