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: 1135

NUMBER OF CREDITS: 3 (1 lecture, 2 lab)

COURSE TITLE: Electrical Controls II

CATALOG DESCRIPTION:
Analyze electrical control circuits used in industrial environments. This course includes the control of electromechanical devices, AC and DC motors, and solid state control devices. Electrical schematics used to interpret logic and circuit function. Students will design, wire, and troubleshoot electromechanical and motor starter circuits using common industrial devices and components.

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:

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:

ACADEMIC CONTENT: The academic objectives of this course are:
   a. Demonstrating the knowledge and skills of electrical control circuits used in an advanced industrial environment.
   b. Apply skills in designing, wiring, troubleshooting, and operation of electrical control circuits.
THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
   a. Completing homework (reading, reports, labs, and worksheets)
   b. Participating in classroom discussions and activities
   c. Taking open and closed book quizzes and tests
   d. Design, wire, and troubleshoot electrical control circuits

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 and lab activities
   c. Working with students from other cultures

TOPICS TO BE COVERED:
1. Electrical calculations
2. Symbols and diagrams
3. Test instruments
4. Electrical safety
5. Control logic
6. Input and output control devices
7. AC and DC circuits and components
8. AC and DC motors
9. Motor starter circuits
10. Solid State motor drives
11. Proximity sensors
12. Photo-electric sensors

COURSE LEARNING OUTCOMES (GENERAL):
1. Interpret electrical control circuit logic and applications
2. Demonstrate ability to read schematics and understand symbols
3. Design various control circuits using electromechanical and solid state components
4. Apply skills in designing, wiring, troubleshooting, and operation of electrical control circuits.

STUDENT LEARNING OUTCOMES (SPECIFIC):
1. Calculate electrical quantities
2. Interpret symbols and diagrams
3. Identify electrical safety hazards
4. Design, connect, and operate electrical control circuits
5. Interpret electrical logic functions
6. Identify various proximity and photo-electric sensor applications
7. Wire solid state NPN/PNP sensor control circuits
8. Design magnetic motor starter control and power circuits
9. Analyze AC and DC motor types and construction
10. Perform circuit measurements using test instruments

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
- Problem Solving
- Individual Projects
- Oral Presentations
- Worksheets
- Interactive Lectures
- Collaborative Projects
- Textbook Problems
- Papers
- Creative Projects
- Term Paper
- Group Problems
- Portfolio
- 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.

A Member of the Minnesota State Colleges and Universities System
An Affirmative Action Equal Opportunity Educator/Employer

Revised 10/1/16