

MESABI RANGE COLLEGE

Course Outline

Course Title: Programmable Logic Controllers
Semester Course Prefix and Number: ECM 1251
Old Quarter Course Prefix and Number:

Submitted By: Robert Stevens
Approval Date:
Revision Date: 9/6/16

Number of Credits: 3 **Number of Lecture Credits:** 1
Semester(s) Offered: Spr **Number of Lab Credits:** 2 **Number of Lab Hours:** 4
Class Size: 24 **Number of Studio/Demonstration/Internship Credits:**
Negotiated by AASC on:
(date)

Course Purpose Code:

- 0 – Developmental Courses
- 1 – Non-transferable
- 2 – Technical course related to career programs
- 3 – College course which has the primary goal of applying certain concepts (e.g. vocal ensemble)
- 4 – Other college course not considered a part of MNTC (e.g. computer science, health, physical education)
- 5 – Course which is intended to fulfill the Minnesota Transfer Curriculum (MNTC) requirements or intended for transfer.
- 9 – Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

Catalog Description:

The course is a "Hybrid" or "Blended" course with the majority of the learning environment traditional in-class lectures and hands-on lab work which also includes Web-based learning activities to complement face-to-face work. This course is an introductory class covering the installation, operation, and programming of industrial programmable logic controllers (PLCs). Lecture reviews a variety of PLC types/manufacturers and the components of a PLC system. Labs provide hands-on activities demonstrating the practical use of PLCs in industrial control.

Prerequisites and/or recommended entry skills/knowledge:

Course Prerequisite(s): ECM 1253, ECM 1243
Reading Prerequisite: None
Composition Prerequisite: None
Mathematics Prerequisite: None

Career Programs and Transfer Majors Accessing this Course:

Electrical Controls and Maintenance Diploma
Electrical Controls and Maintenance AAS

Minnesota Transfer Curriculum Goal(s) partially met by this course if applicable:

(Notes: No more than two goals may be met by any one course. AASC review and the Chief Academic Officer's approval are required.)

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| 0. <input checked="" type="checkbox"/> None | 6. <input type="checkbox"/> The Humanities and Fine Arts |
| 1. <input type="checkbox"/> Communications | 7. <input type="checkbox"/> Human Diversity |
| 2. <input type="checkbox"/> Critical Thinking | 8. <input type="checkbox"/> Global Perspectives |
| 3. <input type="checkbox"/> Natural Sciences | 9. <input type="checkbox"/> Ethical and Civic Responsibility |
| 4. <input type="checkbox"/> Mathematical/Logical Reasoning | 10. <input type="checkbox"/> People and the Environment |
| 5. <input type="checkbox"/> History and the Social and Behavioral Sciences | |

Learning Outcomes: (including any relevant competencies listed in the Minnesota Transfer Curriculum)

Upon completion of this course, the student will be able to:

- Interpret insulation manuals and perform installation and wiring of PLC I/O.
- Describe the major components processors function, program scan, and types of memory.
- Configure programming software and communication configuration for PLCs.
- Write, read, and store relay ladder logic programs to the PLC.

Student Assessment Methods:

Assessment made of lab assignments, worksheets, and papers using rubrics and check lists. Tests and quizzes of technical knowledge to be given at regular intervals during semester.

Use of Instructional Technology: (includes software, interactive video and other instructional technologies):

ECM Laptop Computer Lease with Industrial Software

Additional Special Information: (special fees, directives on hazardous materials, etc.)

Laptop Computer Lease and Required Tool List

Transfer Information: (Please list colleges/majors that accept this course in transfer.)

None

Affiliated Mesabi Range College Courses and Programs:

Approvals:

Body	Representative Signatures	Date
Faculty Association		
Academic Affairs Standards Committee		
Chief Academic Officer		

Distribution: Original – Instructional Services
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Revised: December 2012