Course Title: Programmable Logic Controllers
Submitted By: Robert Stevens
Semester Course Prefix and Number: ECM 1251
Old Quarter Course Prefix and Number: 
Approval Date: 
Revision Date: 9/6/16
Number of Credits: 3
Number of Lecture Credits: 1
Number of Lab Credits: 2
Number of Lab Hours: 4
Number of Studio/Demonstration/Internship Credits: 4

Class Size: 24

Course Purpose Code:
_____ 0 – Developmental Courses
_____ 1 – Non-transferable
x _____ 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.)

0. x None  6. _____ The Humanities and Fine Arts
1. _____ Communications  7. _____ Human Diversity
2. _____ Critical Thinking  8. _____ Global Perspectives
3. _____ Natural Sciences  9. _____ Ethical and Civic Responsibility
4. _____ Mathematical/Logical Reasoning  10. _____ People and the Environment
5. _____ 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:**

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**Distribution:** Original – Instructional Services

**Copies:** Transfer Specialist, Originating Faculty Member, Records

**Revised:** December 2012