

**MESABI RANGE COMMUNITY & TECHNICAL COLLEGE – VIRGINIA/EVELETH  
COURSE OUTLINE**

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**Course Title:** Programmable Logic Controllers  
**Quarter Course Prefix and Number:**  
**Semester Course Prefix and Number:** EIAT1251

**Approval Date:**  
**Revision Date:**

**Number of Credits:** 3      **Number of Lecture Credits:** 1      **Number of Lab Credits:** 2  
**Semester(s) Offered:**      **Number of Studio/Discussion Credits:**

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**Course Purpose Code:**

- 0 – Developmental Courses
- 1 – Non-Transferable General Studies
- 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 general education (MNTC) e.g. computer science, health, physical education
- 5 – Course which is intended to fulfill Minnesota Transfer Curriculum (MNTC) requirements.
- 9 – Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

**Catalog Description:**

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/manufactures and the components of a PLC systems. Lab provide hands-on activities demonstrating the practical use of PLCs in industrial control.

**Prerequisites and/or recommended entry skills/knowledge:**

Course Prerequisite(s): EIAT 1253, EIAT 1233, EIAT 1243, EIAT 1295, & EIAT 1244

Reading Prerequisite:

Composition Prerequisite:

Mathematics Prerequisite:

**Career Programs and Transfer Majors Accessing this Course:**

Electrical & Industrial Automation Technology

**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. (Curriculum Committee review and the Vice President of Academic Affairs 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:**

The following list of course goals will be addressed in the course:

1. identify the major components of a PLC system and describe their functions.
2. describe advantages of using PLC's in industrial control
3. wire PLC inputs and outputs
4. describe the processor's function, program scan, and types of memory.
5. describe three types of programming devices used with PLCs.
6. access PLC specifications from manufacturer's manuals.
7. identify the terms used in conjunction with memory storage.
8. interpret tables and maps to identify specific types of memory locations.
9. convert from one numbering system to another
10. identify types of electrical drawings and symbols related to PLCs.
11. describe relay ladder logic instructions used in PLCs.
12. identify the methods and interface equipment used to program PLCs
13. interface to and operate programming devices with PLCs
14. write, read, and store relay ladder logic programs to the PLC.
15. define common terms associated with programming PLCs
16. correct ladder logic to be agreeable with the design restrictions of the manufacture.

**Possible student assessment methods:**

Lecture assignments and tests, Lab exercises tests

**Use of instructional technology (includes software, interactive video and other instructional technologies):**

PLCs, Programming software, discrete devices, and instructional videos.

**A one-paragraph summary or outline of the major course content:**

This course covers the identification and operation of PLC systems and components. Lectures discuss the operational, application, and methods of control used by PLCs in the industrial control systems. Lab exercises provide practical experience in the wiring, programming and troubleshooting of PLCs.

**Additional special information (special fees, directives on hazardous materials, etc.)**

Lab Fee

**APPROVALS:**

Body	Representative Signatures	Date
Curriculum Committee		
Faculty Association		
Meet and Confer		
Vice President of Academic Affairs		

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