

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

Course Title: **Advanced Programmable Logic Controllers**
Quarter Course Prefix and Number:
Semester Course Prefix and Number: **EIAT 2252**

Approval Date:
Revision Date:

Number of Credits: **4** **Number of Lecture Credits:** **1** **Number of Lab Credits:** **3**
Semester(s) Offered: **Number of Studio/Discussion Credits:**

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 advanced PLC course designed for students who have previous PLC programming experience or have completed the EIAT 1251 Programmable Logic Controls course. The course covers advanced programming instructions such as sequencers, analog I/O, and PID control. The course develops a student's understanding of the PLC's file structure and organization of user programs. In addition, the course introduces the student to programming languages, terminology, and standards set by the IEC (International Electrotechnical Commission) Standard IEC1131-3. In addition, the course covers communication protocol and methods designed to send and receive data between multiple PLCs. Lab exercises provide hands-on activities demonstrating the practical application of plant wide control systems.

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 student will:

1. The student will have comprehensive knowledge International Standards that apply to the configuration and programming of PLCs
2. The student applies proper safety rules when working PLCs and associated electrical equipment.
3. The student will be able to resource technical data from manufactures and control equipment associations (IEC, NEMA).
4. The student can interpret technical O/M manuals for the installation, configuration, operation, and maintenance of PLCs and associated equipment
5. The student's work is performed in a professional and workmanship manner.

Possible student assessment methods:

Lab assignments, worksheets, papers, and tests.

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

Power Point Software, videos, web research, interactive PC bases learning modules, and lab facilities/equipment

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

This course focuses on the practical application and operation of primary elements used in industrial instrumentation to measure pressure, level, and flow of liquids and gases. The course provides hands-on experience in the installation and calibration of measuring elements and their associated transmitters.

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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