

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

Course Title: Introduction to Process Control
Quarter Course Prefix and Number:
Semester Course Prefix and Number: EIAT1275

Approval Date:
Revision Date:

Number of Credits: 2 **Number of Lecture Credits:** 1 **Number of Lab Credits:** 1
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 designed as an introduction to industrial process control. The course will cover basic definitions, types of control, symbols and prints, instruments used in control, and elementary control loop design. The course will identify the duties and tasks performed by instrumentation technicians. The course is a prerequisite to additional instrumentation courses offered by Mesabi Range College.

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. identify the stages of control functions
2. define process control
3. define terms used in process control
4. define what a process is and give examples of processes.
5. describe and give examples of process parameters.
6. list and describe the fundamental stages of control functions.
7. define process control and terminology.
8. identify the terms associated with the components of control systems.
- 9. identify the function, purpose and location of different instruments in a control loop.**
10. identify instruments for making physical and chemical measurement
11. describe the method used to convert physical/chemical action or effects
12. define terms used describe instrument characteristics
13. identify the functions of transducers in control loops.
14. identify functions provided by signal conditioners.
15. identify types of signals used to transmit information in control loops.
16. describe "Smart Transmitters" advantages over conventional transmitters
17. identify the terms associated with final control elements.
18. identify and describe the operation of final control elements.
19. describe methods and devices used to actuate final control elements.
20. describe the operation and use of signal conditioners for final control elements.
21. describe the operation of controllers
22. describe the different types of control modes
23. identify the basic input and output of controllers
24. define tuning parameters
25. diagram four types of control loops
26. associate each type of control loop to specific control applications
27. identify symbols and diagrams used in process control to illustrate the type, application, and location of instruments
28. identify instrument drawing connection lines used to define the types of signals that interconnect instrumentation devices.
29. identify logic symbols defining the function of relays, transmitters and controllers.
30. identify symbols representing primary and final control elements.
31. Identify types of wire used for instrumentation
32. Identify environmental problems that can effect instrument signals
33. Identify proper techniques and wiring practices for instrumentation wiring
34. Lay-out wiring for control loops

Possible student assessment methods:

Lecture assignments and tests, Lab exercises tests

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

Power Point Software, videos, motor control lab facilities and equipment

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

This course will focus on the basic applications of process control. The course will identify terminology used in process control, the types of process control, identify common measured variables, and equipment used for measurement and control.

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		

Distribution: Original – Administrative Office, Library, Learning Center, Records, Student Services