

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

Course Title: **Controllers and Control Loops**  
Quarter Course Prefix and Number:  
Semester Course Prefix and Number: **EIAT 2277**

Approval Date:  
Revision Date: **2/22/06**

Number of Credits: **2**      Number of Lecture Credits: **1**      Number of Lab Credits: **1**  
Semester(s) Offered:      Number of Studio/Discussion Credits:  
Class Size: **24**  
Negotiated by AASC on  
(Date)\_\_\_

**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 covers the core of industrial process control, control loops and controllers. The course defines the components, configuration, installation, and I/O calibration of control loops. Analysis of control modes and algorithms for PID control are studied and practiced in a lecture/lab environment. Control mode design and system architecture complete the study.

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

Course Prerequisite(s):      EIAT 1275 and Introduction to Computers.  
Reading Prerequisite:      Minimum score on basic skills test  
Composition Prerequisite:      None  
Mathematics Prerequisite:      Minimum score on basic skills test

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

Electrical and Industrial Automation Technology

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

- |   |   |
|---|---|
| 0. <input checked="" type="checkbox"/> 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:**

Following the completion of this course the student will be able to demonstrate the ability to:

- 1.) Identify controller variables.
- 2.) Identify the controller PID algorithm.
- 3.) Define process dynamics variables.
- 4.) Tune PID controllers.
- 5.) Implement PID control in an integrated process..
- 6.) Troubleshoot PID loops.

**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, software based lab simulators.

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

See "Learning Outcomes" above.

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

Laptop Computer Lease

**Approvals:**

<b>Body</b>	<b>Representative Signatures</b>	<b>Date</b>
Curriculum Committee		
Faculty Association		
Academic Affairs Standards Committee		
Chief Academic Officer		

Distribution: Original – Administrative Office

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Revised February 10, 2004