

# MESABI RANGE COMMUNITY & TECHNICAL COLLEGE

## Course Outline

**Course Title:** Automation Components & Equipment  
**Semester Course Prefix and Number:** PAS 2264  
**Old Quarter Course Prefix and Number:**

**Submitted By:** Scott Norcia  
**Approval Date:**  
**Revision Date:** 11/23/11

**Number of Credits:** 2  
**Semester(s) Offered:** Fall  
**Class Size:** 24

**Number of Lecture Credits:** 1  
**Number of Lab Credits:** 1    **Number of Lab Hours:** 2  
**Number of Studio/Demonstration/Internship Credits:**

Negotiated by AASC on:  
(date)

### Course Purpose Code:

- 0 – Developmental Courses
- 1 – Non-transferable, General Education
- 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 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:

This course covers the discrete devices and integrated circuit components used in modern automated control systems. Topics include the components and design of systems for power distribution and control interfacing. The course details the operation, configuration, and installation of devices and equipment used for position, motion and speed control of motor drives. Course lab assignments provide hands experience in designing, wiring, and configuring system components into an integrate control system. Additional topics covered will include print reading, hazardous location wiring, and power quality analysis.

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

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

Reading Prerequisite:

Composition Prerequisite:

Mathematics Prerequisite:

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

Process Automation Systems Diploma

Process Automation Systems 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. Curriculum Committee review and the Chief Academic Officer's 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)

Upon completion of this course, the student will be able to:

1. Identify the configuration of power distribution systems and components
2. Interpret Motor Control Center (MCC) schedules and maintenance procedures
3. Identify main sources of power and control
4. Read and interpret electrical points and diagrams.
5. Design, develop, and document complex control circuits
6. Identify types of non-intrusive sensors used in the detection of machine position and target object location.
7. Troubleshoot complex control circuits using flow charts and timing diagrams
8. Properly wire, adjust/calibrate and troubleshoot variable speed drive systems.
9. Configure power, control and communication wiring of MCCs systems for hazardous locations
10. Identify power factor correction

**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, motor and machine control lab facilities and equipment

**Outline or Statement of Major Course Content:**

This course will provide typical machine control system explanations, illustrations, and application that typical of those found in industry. The lab application will be performed with actual industrial grade control systems. The focus will be on the design, wiring, and troubleshooting of systems.

**Additional Special Information:** (special fees, directives on hazardous materials, etc.)

None

**Transfer Information:** (Please list colleges/majors that accept this course in transfer.)

None

**Approvals:**

Body	Representative Signatures	Date
Curriculum Committee	<i>Ann R. Kolton</i>	11-29-11
Faculty Association	<i>Sue Devereux</i>	12-5-11
Academic Affairs Standards Committee	<i>Ann R. Kolton</i>	11-29-11
Chief Academic Officer		

**Distribution:** Original – Administrative Office

**Copies:** Curriculum Committee Chair, AASC Chair, Transfer Specialist, Originating Faculty Member, Scheduler, Records, Student Services, Learning Center, Library

**Revised:** October 2006