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

Course Title: **Robotic Work Cells** **Approval Date:**
Quarter Course Prefix and Number: **Revision Date:**
Semester Course Prefix and Number: **EIAT 2275**

Number of Credits: **4** **Number of Lecture Credits:** **0** **Number of Lab Credits:** **4**
Semester(s) Offered: **Number of Studio/Discussion Credits:**

Course Purpose Code:

_____ **0 –** Developmental Courses
_____ **1 –** Non-Transferable General Studies
__X__ **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 basic robot principles through applied theory and practical lab applications. The course will cover all of the individual components that it takes to make up a total robotic system. The construction, programming, and operation of the training robot used is identical to most industrial robots which are being used in industry. The training robot will be integrated into workcells with actual industrial sensors and equipment.

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).

0. __X__ None
1. _____ Communications
2. _____ Critical Thinking
3. _____ Natural Sciences
4. _____ Mathematical/Logical Reasoning
5. _____ History and the Social and Behavioral Sciences
6. _____ The Humanities and Fine Arts
7. _____ Human Diversity
8. _____ Global Perspectives
9. _____ Ethical and Civic Responsibility
10. _____ People and the Environment

Learning outcomes, including any relevant competencies listed in the Minnesota Transfer Curriculum:
The student will:

1. exhibit professionalism
2. identify robot system elements
3. inspect robot mechanical connections
4. inspect robot electrical connections
5. identify three robot safety regions
6. interface controller and robots
7. program single axis moves
8. program multiple axes moves
9. execute pick & place routine
10. demonstrate accuracy specifications
11. demonstrate repeatability specifications
12. use I/O auxillary output port
13. use I/O auxillary input port
14. describe material handling techniques
15. demonstrate material handling techniques
16. describe basic hardware maintenance
17. describe palletizing application techniques
18. demonstrate palletizing application techniques
19. describe vacuum gripper operation
20. describe mechanical gripper types
21. calculate robot payload
22. confirm computer/controller operation
23. write material handling program
24. demonstrate four modes of operation
25. diagram program flow

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, robotic control lab facilities and equipment

A one-paragraph summary or outline of the major course content:
This course covers basic industrial robotic principles through applied theory and practical lab applications. The course will cover the individual components and system interfacing that it takes to make up a total robotic work cell. The construction, programming, and operation of industrial robots are presented though hands on exercises. Lab exercises will require integrating pneumatic and NC robots, position sensing, and motion control into work cells over seen by a programmable logic controller. Application of work cell equipment will require in depth review of manufactures operating manuals and documentation.

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