FST232 Hazardous Materials II

I. CATALOG DESCRIPTION

Co-requisite: MTT234  
Pre-requisite: MTT151 and MTT263

2 credit hours

Computer Integrated Manufacturing (C.I.M.) is further advancement into the computer integrated side of the Machine Tool industry. This class will include safety practices, EIA programming, basic computer operating skills, an introduction to AutoCAD, as well as the operation of CNC machine tools.

II. COURSE GENERAL OBJECTIVES

A. To develop safe working habits and attitudes  
A. To develop pride in workmanship  
C. To develop vocabulary peculiar to the trade  
D. To learn how to write programs using EIA format  
E. To learn the use of computers in the machine tool trade  
F. To introduce the student to the capabilities of AutoCad  
G. To enhance further use of intricate measuring tools  
H. The student will complete programs and successfully run their projects on the CNC machine

III. COURSE OUTLINE

A. Introduction to general outline and nomenclature of the CNC machine tool  
A. Introduction to the procedures for setting up a CNC machine  
A. Introduction to the Cartesian coordinate system and absolute vs. incremental positioning  
A. Introduction to the basic use of Windows for file transfers  
A. Introduction to computer aided drafting (AutoCad)  
A. Using AutoCad to draw first project  
A. Introduction to G-codes for milling and positioning  
A. Introduction to miscellaneous functions (m-codes)  
A. Introduction to cutter compensation  
A. Introduction to canned cycles  
A. Produce program to make project

IV. COURSE OBJECTIVES
A. Introduction to General Outline and Nomenclature of the CNC Machine
   (Unit 1, pages 1-23)

   In this section, the student will learn the machine tool nomenclature and how it functions. The student will also learn safety of the machine and tools used around the machine.

B. Introduction to the Procedures for Setting up a CNC Machine
   (Unit 2, pages 25-41) and (Unit 5, pages 95-124)

   After completing this section, the student will be familiar with the procedures in setting up the machine tool, which will include the following: work holding, proper order of processing, and selecting tools.

C. Introduction to the Cartesian Coordinate System and Absolute vs. Incremental Positioning.
   (Unit 4, pages 77-93)

   After completing this section the student will understand the Cartesian coordinate system and successfully demonstrate the use of it in comparison from absolute to incremental positioning.

D. Introduction to the Basic Use of Windows for File Transfers

   After completing this section the student will understand basic Windows based functions and will successfully demonstrate file transferring and copying.

E. Introduction to Computer Aided Drafting (AutoCAD)

   After completing this section the student will understand basic AutoCad capabilities and will successfully be able to find their way around AutoCad, drawing lines, arcs, and various functions.

F. Using AutoCad to Draw First Project

   After completing this section the student will be capable of drawing an entire part and dimensioning the part to successfully enable each student to write a program from given part.

G. Introduction to G-codes for Milling and Positioning
   (Unit 6, pages 127-156)
After completion of this section the student will understand the basic G-codes for positioning and actual cutting on the machine tool, and will demonstrate this with successfully writing small sample programs per blueprints given in demonstration.

H. Introduction to Miscellaneous Functions (M-codes)  
(Unit 7, pages 159-172)

After completion of this section the student will understand the miscellaneous functions and how to use them in the program to operate the accessories on the machine tool.
I. Introduction to Cutter Compensation  
(Unit 9, pages 193-217)

After this section the student will understand the use of cutter compensation and how to implement it into the program allowing the student to use all print dimensions in their program, keeping mathematical situations to a minimum. The student will demonstrate this on the machine after writing the program for the machine of a part from blueprint given in class.

J. Introduction to Canned Cycles  
(Unit 8, pages 173-190)

After completion of this section the student will learn what a canned cycle is and how to use them in the program that produces holes and threads on their part.

K. Produce Program to Make a Project

After completion of the previous section the student is now given a project to do with the help of the instructor. Each student will write a program and set up the machine tool to successfully produce the project given to the student.

V. METHOD OF INSTRUCTION

Lectures  
Demonstrations  
Shop project  
Classroom participation

VI. REQUIRED TEXTBOOK

Handouts from *CNC Programming Principles and Application*, Mike Mattson

VII. REQUIRED MATERIALS

Notebook  
Calculator  
Pencils  
2 3 1/2 floppy disks

VIII. SUPPLEMENTAL REFERENCES

Manuals for the specific machine tool are located in the shop area.
IX. METHOD OF EVALUATION

A= 100-94
B= 94-84
C= 84-74
D= 74-68
F= below 68

Attendance 10%
Projects 30%
Homework 35%
Attitude 5%
Test 10%
Final 10%

- Late homework will not be accepted without prior consent.
- No test can be made up without prior consent.
- Three tardies = 1 absence.

Four absences = reduction of one letter grade. After six absences the instructor will turn in an administrative drop.