MOHAWK VALLEY COMMUNITY COLLEGE

UTICA-ROME, NY

PHYSICAL SCIENCE, ENGINEERING & APPLIED TECHNOLOGY

COURSE OUTLINE

ADVANCED CNC MILLING MT 293

REVISED BY BRYAN ALGUIRE – 2/17

# COURSE OUTLINE

1. CATALOG DESCRIPTION

**MT 293 Advanced CNC Milling C-2, P-6, Cr-5**

This course covers advanced concepts of CNC milling centers. This course is the third in the series of assessment-based courses in the CNC/Machinist curriculum. Evaluation is based on the ability to demonstrate knowledge and experience in all topics of study. Topics include safety, blueprint reading, Geometric Dimensioning and Tolerancing (GD&T), machining a work piece to drawing specification, CNC programming for vertical milling machines, use of CNC vertical milling machines, proper tolling and work-holding methods, and how to determine sequential machining operations of complex parts.

Corequisite: MT 292 Introduction to CNC Milling

### MATERIAL

TEXT : Technology of Machine Tools , latest edition by Krar,

by Mc-Graw-Hill Publishers

Blueprint Reading for the Machine Trades, latest edition, by Schultz, by Pearson Publishers

Mastercam Mill Training Tutorials, latest edition by Lendel,

In-House Solutions, Inc.

Scientific Calculator

Industrial grade safety glasses or goggles (for use in lab)

USB memory stick

1. STUDENT LEARNING OUTCOMES:

##### The student will demonstrate knowledge and understanding of how and why Geometric Dimensioning and Tolerancing is applied to engineering blueprints.

1. The student will demonstrate the difference between Least Material Condition(LMC) and Maximum Material Condition (MMC).

##### The student will demonstrate the understanding of machine coordinate systems for CNC Vertical Milling Machines.

##### The student will demonstrate the understanding of Absolute vs. Incremental programming methods.

1. The student will demonstrate the understanding of cutter compensation and its purpose in CNC programming for milling machines.

##### The student will demonstrate the ability to write a simple program for a CNC Vertical Milling Machine.

##### The student will demonstrate machine setup on a CNC Vertical Milling Machine.

##### The student will demonstrate the selection and calibration of all tooling required for different types of machining operations.

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##### The student will demonstrate how to establish Part-Tool Zeros.

##### The student will demonstrate the safety procedures required to use both machine tools and hand tools.

##### The student will demonstrate his/her overall knowledge and ability in CNC Vertical Milling Machining, programming, set-up, and safe operation.

##### The student will demonstrate his/her knowledge and ability in the use of measuring and inspection tools.

##### The student will demonstrate the ability to complete the Group Project to blueprint specifications.

# IV MAJOR TOPICS:

1. Shop safety
2. Blueprint reading
3. Shop math
4. Measurement & Inspection
5. Bench work
6. Metal cutting theory
7. CNC Milling
8. CNC Milling Machine Programming
9. Advanced CNC Milling
10. High Speed Machining
11. Manufacturing Processes
12. Group Project

# **COURSE NAME:\_\_\_\_\_MT 293 Advanced CNC Milling \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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## **DATE DATE FACULTY NAME CHANGE INPUT MEASUREMENT ASSESSMENT ACTION**

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| **1/11/11** | **B.Alguire** | **Eliminated header, disability statement, and grading policies per Middle States** | **MVCC faculty** | **Standardize outlines college wide** |  | **None** |
| **1/27/14** | **B.Alguire** | **Update Course Outline** | **MVCC faculty** | **Standardize outlines**  **College wide** |  | **None** |
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