MOHAWK VALLEY COMMUNITY COLLEGE

UTICA-ROME, NY

COURSE OUTLINE

MULTI-AXIS CNC MACHINING MT 296

# COURSE OUTLINE

1. CATALOG DESCRIPTION

**MT 296 Multi-Axis CNC Machining C-2, P-6, Cr-4**

This course introduces fundamental concepts of Multi-Axis CNC Turning and Milling centers. Topics include safety, blueprint reading, machining a work piece to drawing specification, CAM programming software, CNC programming for Multi-Axis lathes, CNC programming for 4 and 5 axis machining centers, use of CNC milling machines and lathes, proper tooling and work-holding methods, advanced machining setups and tolling for milling machines and lathes, and topics on CNC wire EDM machining.

Corequisite: MT295 Advanced CNC Turning Centers

### MATERIAL

Scientific Calculator

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

1. STUDENT LEARNING OUTCOMES:
2. The student will demonstrate the knowledge and understanding of advanced engineering blueprints.

##### The student will demonstrate the ability to write a multi-axis program for a Multi-axis CNC Lathe and Mill.

##### The student will demonstrate work piece and machine setup on a CNC Multi-axis CNC Lathe and Mill.

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

##### The student will demonstrate how to establish Part and Tool Zeros on a Multi-axis CNC Lathe and Mill.

1. The student will demonstrate muti-axis setups on the CNC Lathe and CNC Vertical Milling Machines.
2. The student will demonstrate the safety procedures required to use both machine tools and hand tools.
3. The student will demonstrate the ability to develop complex programs for a CNC Vertical Milling Machine by using CAM programming techniques.
4. The student will demonstrate the ability to develop complex programs for a CNC Lathe by using live tooling, bar pulling, and canned cycles programming techniques.

##### A student will demonstrate his/her overall knowledge and ability in CAM, CNC programming, machine set-up, and machine operation.

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

# IV MAJOR TOPICS:

1. Shop safety
2. Blueprint reading
3. Measurement & Inspection
4. Bench work
5. Metal cutting theory
6. Multi-Axis CNC Milling 4 and 5 axis
7. Muti-Axis CNC Lathe Programming
8. Wire EDM
9. AutoCAD
10. Mastercam
11. Student Projects

# **COURSE NAME:\_\_\_\_\_MT 295 Multi-Axis CNC Machining \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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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** |
| **10/9/19** | **B. Alguire** | **Changed credit hours from 5 to 4** | **MVCC faculty** | **Update outline** |  | **None** |
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