



MTT 2430

Division: Career and Technical Education

Department: Machine Tool Technology

Course: MTT 2430

Title: CNC Operations

Catalog Description:

This course is for second year students who want to enhance their programming and operating skills. It reviews different manufacturing materials and cutting processes. Students learn about industrial computer aided machining (CAM) software and the process of computer aided manufacturing. It emphasizes fixturing and basic machine setups.

General Education Requirements: N/A

Semesters Offered: TBA

Credit/Time Requirement: Credit: 8; Lecture: 3; Lab: 15

Clock/Hour Requirements: 270

Offered for Non-Credit: No

Prerequisites: MTT 2330

Corequisites: None

Justification:

This course is approved by our program advisory committee and is comparable to UVSC MTT 2340.

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

- develop computer aided drafting (CAD) drawings using CAD Key software
- use CAM software to develop a program to produce a part to specifications on the print
- understand how to convert CAD files to CAM files using Mastercam
- develop fixtures that hold work securely for machine productivity.

Content:

Course objectives will be accomplished by providing students with learning experiences in the following subject areas:

- introduction to CAD Key design software
- using Mastercam to produce two dimensional programs
- using Mastercam to produce three dimensional programs
- converting Auto CAD files to Mastercam programs
- learn different fixturing techniques for CNC machines.

General Education Outcomes:

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- 4) Retrieve, evaluate, interpret, and deliver information through a variety of traditional and electronic media. Students will research projects through the *Machinery Handbook*, Internet, and company-specific websites. Specifications on material structure, machineability, and other details for a given job will need to be identified, evaluated, and interpreted before being applied to production.
- 6) Apply computational skills to a variety of contexts. Previously acquired mathematical skills will be applied in a lab setting. Students will be required to compute details of layout, reverse engineering, and programming as they prepare and complete a given project.
- 7) Apply scientific reasoning to a variety of contexts. Through the machining process, students are required to assess problems for possible solutions. Students will be involved in planning, design, and application of concepts they have learned in order to arrive at a quality-controlled product. Students will need to apply these skills to specific projects in order to arrive at the most efficient solution.

Key Performance Indicators:

In class:

- Students demonstrate safety practices while working in the shop.
- Written tests and quizzes are given on major subject areas with a required 75% minimum accumulated score.
- The student's knowledge and skills are tested by the ability to complete assignments with a required 75% minimum accumulated score.

Following class:

- Upon completion of the course, competency will be demonstrated in subsequent courses and on projects.

Representative Text and/or Supplies:

- *Mastercam Mill, Mastercam Lathe, Mastercam Design*, current editions, CNC Software Inc.

Optimum Class Size: 10

Maximum Class Size: 20

Signatures:

I hereby submit this course syllabus:

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I hereby find this course consistent with the goals and resources of the Machine Tool Technology Department:

Alan Hart, AAS, Instructor, Chair

I hereby find this course consistent with the goals and resources of the Career and Technical Education Division:

Michael P. Medley, MBA, Assistant Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)