



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**ADVANCED MASTERCAM TRAINING
MTT3550 3 Credit Hours**

Student Level:

This course is open to students on the college level in either the Sophomore year or students in the programming field needing to update training and to area high school vocational students.

Catalog Description:

MTT3550 - MASTERCAM ADVANCED TRAINING (3hrs)

Advanced training in the use of the lathe versions of Mastercam programming.

Prerequisites:

MTT3547 Advanced Computer Aided Manufacturing (CAM) or instructor approval.

Controlling Purpose:

This course is designed to help the student increase their knowledge concerning concepts and principles in the use of the Mastercam programming system.

Learner Outcomes:

Upon completion of the course, students will be able to demonstrate the use of the Mastercam programming system to draw, run tool paths, and create programs in 3D with the use of surfaces and projections.

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the

Rev: 6/01/2016

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less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.

- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: Mastercam Mill 3-D						
Outcomes: Upon completion of this unit, the student will be able to successfully demonstrate using the Mastercam Mill to create, rotate, scale, and copy.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Demonstrate how to use and create 3-D surfaces.
						Create letters in Mastercam to be projected onto surfaces.
						Create loft and ruled surfaces.
						Demonstrate polar coordinates in various construction planes.
						Create coons surfaces using different types of boundaries.
						Demonstrate changing geometry to different levels.
						Use translation commands to move geometry by vectors.
						Rotate geometry using the rotation commands and various construction planes.

UNIT 2: Mastercam Tool Paths

Outcomes: Upon completion of this unit, the student will be able to successfully use Mastercam to create tool paths for 3-D swept, coons, multi-surface, and explain how these are used.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain how to project onto surfaces.
						Demonstrate how to project on curves.
						Demonstrate the trimming of surfaces to other surfaces.
						Demonstrate the making of a tool path on single and multiple surfaces.
						Run the post processor for the Cincinnati and editing the resulting CNC file.
						Run the post for the Heidenhain and editing the resulting CNC file.
						Demonstrate how to project tool paths onto surfaces.
						Demonstrate how to project pockets onto surfaces and trim the result.
						Demonstrate how to edit a CNC file in Mastercam including renumbering and replacing multiple changes using the search and replace command.

UNIT 3: Communications with CNC Machines

Outcomes: Upon completion of this unit the student will be able to successfully demonstrate the communications needed between the CAM system and the CNC machines, both sending and receiving.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Demonstrate the set up procedure for transmitting programs to the CNC.
						Demonstrate transmitting programs to both mills and lathes.
						Set up both mills and lathes for receiving from the CAM system.

Projects Required:

Students will complete a semester project of their choice or be provided one by the instructor. The project will be the level of equal complexity to the one assigned by the instructor. The student will be expected to do the majority of the work on his own utilizing his past training. The student will be responsible for keeping this complex drawing and tool path on the appropriate number of computer disks in order to transfer information from one computer to another.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

A minimum of 4 computer disks.

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.