



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**ADVANCED COMPUTER AIDED MANUFACTURING (CAM)
MTT3547 3 Credit hours**

Student Level:

This course is open to students on the college level in either the freshman or sophomore year and to area high school vocational students.

Catalog Description:

MTT 3547 - ADVANCED COMPUTER AIDED MANUFACTURING (CAM) (3 hrs)

This is an advanced course in CAM. Instruction will cover in greater detail the CNC Milling Machine, the CNC Lathe, and a complex 3-D profile program for a machining.

Prerequisites:

MTT3544 Computer Aided Manufacturing or instructor approval.

Controlling Purpose:

This course is intended to provide the student with advanced knowledge, concepts, and principles of Computer Aided Manufacturing (CAM).

Learner Outcomes:

After completing this unit the student will be able to demonstrate the use of the Mastercam Programming system to draw, run tool paths, and create programs in both 2-D and 3-D.

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.

Rev: 6/01/2016

DISCLAIMER: THIS INFORMATION IS SUBJECT TO CHANGE. FOR THE OFFICIAL COURSE PROCEDURE CONTACT ACADEMIC AFFAIRS.

- B = All major goals have been achieved, but the student has failed to achieve some of the 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 3d surf.
						Create letters on Mastercam for milling purposes.
						Create ellipses
						Create net surfaces.
						Scale geometry up and down.
						Use translation commands to move geometry by vectors.
						Rotate geometry using the rotation commands.

UNIT 2: Mastercam Tool Paths

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

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain how to project on to surfaces.
						Demonstrate the use of the post processor
						Explain how to change the post to the desired post
						Run the post processor for the Cincinnati
						Run the post for the Haas, Okuma, and Fanuc
						Demonstrate how to edit an CNC file in Mastercam

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.
						Set-up both mills for sending to the CAM system.

UNIT 4: Mastercam Lathe

Outcomes: Upon completion of this unit the student will be able to demonstrate the use of Mastercam to create 2-D drawings for lathes and run the tool paths for threading and turning.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Demonstrate 2-D drawings in Mastercam Lathe.
						Demonstrate the tool paths for turning.
						Demonstrate the tool paths for threading
						Run the post processor for the Fanuc and CNC lathe

Projects Required:

The student will complete the 3-D drawing in the Mastercam Tutorial and all 3-D tool paths. The student will run the post for the 3-D tool paths changing the post to match whichever CNC Mill is needed. The student will edit the resulting program to run, and then send the programs to the desired machine. The student will make and run tool paths in Mastercam lathe for turning and threading.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

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.