COMPUTER AIDED DESIGN AND MACHINING
Course Syllabus

Course Number: NCMT-1696  OHLAP Credit: No
OCAS Code: None
Course Length: 90 Hours
Career Cluster: Machining
Career Pathway: Production
Career Major(s): Certified Machine Technician

Pre-requisite(s): After completion of this course students will understand the basic applications of Computer-Aided Drafting (CAD) and Computer Aided Machining (CAM). Students will be able to recognize and explain the uses of wireframe drawings, solid models and surface drawings. Students will create basic toolpaths while learning the principles of toolpath creation. Post Processors and post processor editing will also be explained. Customized instruction in specific CAM software will be given and programming projects will be assigned.

Textbooks: Instructor developed curriculum – on Blackboard site

Course Objectives:

A. Describe the basic applications of CAD
   1. Discuss geometry types.
   2. Explain solid models.
   3. Describe surfaces.
   4. Study the different types of software.

B. Describe the basic applications of CAM
   1. Defining toolpaths.
   2. Discuss features and machining operations.
   3. Creating and/or importing of wireframe, surfaces, solids or other geometry entities.
   4. 2D contouring.
   5. Thinking and working in 3D environments.

C. Explain the uses of and be able to recognize wireframe, solid model and surface drawings
   1. Define the individual entities.
   2. Explain creation of geometry.
   3. Demonstrate the building of solid models and surfaces.
   4. Working with solid models and surfaces in CAM.

D. Describe the basic principles of toolpath creation
   1. Face-milling toolpaths.
   2. HOLEMAKING toolpaths in a mill.
   5. 3D milling toolpaths.
6. Understanding machining verification/simulation.

E. Describe the basic principles of post-processing.
   1. Selecting and utilizing post-processors.
   2. Modifying post-processors

F. CAM software specific training and projects.

NIMS/ODCTE objectives

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures:
   1. Students are graded on theory and shop practice and performance.
   2. Each course must be passed with seventy (70%) percent or better.
   3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment:
   Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit:
   The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility:
   The student must maintain a grade point average of 2.0 or better.