INTRODUCTION TO CNC MILLING  
Course Syllabus

Course Number:  NCMT-1693       OHLAP Credit:  No
OCAS Code:  None
Course Length:  60 Hours
Career Cluster:  Machining
Career Pathway:  Production
Career Major(s):  Certified Machine Operator, Certified Machine Technician

Pre-requisite(s):

Course Description:  This course describes the different types of CNC milling machines. Students will learn CNC milling nomenclature and be able to describe the machine axes used for milling. CNC milling tooling, toolholding, and tool mounting devices will be discussed, identified and described. Workholding devices and their varied uses and applications will also be discussed.

Textbooks:  Instructor developed curriculum – on Blackboard site

Course Objectives:  

A. Identify and describe CNC milling machine types
   1. Discuss differences between CNC mills and CNC machining centers
   2. Identify vertical and horizontal machining centers.
   3. State accessories found on CNC milling machines

B. Describe the machine axes used for milling.
   1. Describe the numerous configurations of axes movement
   2. State how the Cartesian coordinate system applies to a CNC milling machine.
   3. Identify the parts of a CNC mill

C. Learn about the two major types of ATCs
   1. The carousel-type tool changer
   2. The swing-arm type tool changer

D. Identify and describe workholding devices and their application for CNC milling
   1. Clamps
   2. Use and care of machine vises
   3. Chucks, collet closers and indexing fixtures
   4. Pallet systems
   5. Tombstones
   6. Vacuum plates, magnetic work holding and adhesive-based work holding
   7. Custom fixtures

NIMS/TTC 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.