MILLING
Course Syllabus

Course Number: NCMT-1687
OHLAP Credit: No
OCAS Code: None
Course Length: 120 Hours
Career Cluster: Machining
Career Pathway: Production
Career Major(s): Certified Machine Operator, Certified Machine Technician

Pre-requisite(s):
Course Description: In this course, the students will examine the mill's function and fundamental operation with regard to achieving the high level of precision that can be expected of such a machine. Through our discoveries we will gain the insight into basic manual mill operations, set-ups, terminology, safety and use and care of mills; develop a strong foundation in tramming the head of the mill, tramming the vise, and squaring of a work piece; and complete an assortment of projects utilizing a variety of cutters, accessories, and clamping methods. This will be achieved by laboratory instruction and an array of theory implementations. Upon the completion of this course, the students will be able to identify the basic control systems and machining methods used on a vertical milling machine and explain the basic operations necessary to manufacture various types of products.

Textbooks:
Instructor developed curriculum – on Blackboard site

Course Objectives: A. Introduction to Vertical Milling Machine
1. Base and Column
2. Knee
3. Turret
4. Ram
5. Head
6. Optional Features

B. Tools, Toolholding & Workholding for the Vertical Milling Machine
1. Cutter Shanks and Arbors
2. Cutting-Tool Material
3. Proper Cutting-Tool Storage
4. Endmills
5. Flat-surface Milling Cutters
6. Specialty Milling Cutters
7. Toolholding
8. Workholding

C. Vertical Milling Machine Operations
1. General Milling Machine Safety
2. Tramming the Vertical Milling Head
3. Aligning Workholding Devices
4. Speeds and Feeds for Milling Operations
5. Holemaking Operations
6. Milling Basics
7. Squaring a Block
8. Angular Milling
9. Milling Steps, Slots and Keyseats
10. Milling Radii
11. Pocket Milling

D. Indexing & Rotary Table Operations
   1. Parts of the Rotary Table
   2. Rotary Table Setup
   3. Rotary Table Operations
   4. The Indexing Head
   5. Indexing Head Operations

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.