

# COURSE SYLLABUS

<b>Course Title:</b>	Manufacturing Machinery – Milling I		<b>Date submitted:</b>	9/26/14 (AAC: 14-114)
<b>Department:</b>	Business and Technology			
<b>Curriculum:</b>	Technology Studies			
<b>Course Descriptors:</b> Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.	<b>Course Code:</b> (eg. ACC 101)	MFG*155	<b>Prerequisites:</b>	
	<b>Course Type:</b>	D/Y	None	
	A: Clinical B: Lab D: Distance Learning I: Individual/Independent L: Lecture N: Internship M: Seminar P: Practicum U: Studio X: Combined Lecture/Lab Y: Combined Lecture/ Clinical/Lab Z: Combined Lecture/Studio			
	<b>Elective Type:</b>	G		
	AH: Art History E: English FA: Fine Arts G: General HI: History HU: Humanities LA: Liberal Arts FL: Foreign Language M: Math S: Science SS: Social Science			
	<b>Credit Hours:</b>	2	<b>Corequisites:</b>	
	<b>Developmental:</b> (yes/no)	No	None	
	<b>Contact Hours:</b>	Lecture: 1 Clinical: 0 Lab: 2 Studio: 0 Other: 0 TOTAL: 3		
	<b>Class Maximum:</b>	24	<b>Other Requirements:</b>	
	<b>Semesters Offered:</b>	F/Sp/Su	None	
<b>Ability Based Education (ABE) Statement</b>	At Tunxis Community College students are assessed on the knowledge and skills they have learned. The faculty identified the General Education Abilities critical to students' success in their professional and personal lives. In every class, students are assessed on course abilities, sometimes program abilities, and, in most classes, at least one General Education Ability. Students will receive an evaluation of the degree to which they have demonstrated or not demonstrated that General Education Ability.			
<b>Catalog Course Description:</b>	Provides an introduction on the vertical and horizontal milling machines. Topics to include, cutting tools and holders, setups, spindles and arbors, work holding methods.			

**Topical Outline:**

List course content in  
outline format.

- A. Vertical Spindle Milling Machines
  - 1. Identify the major components and controls on the vertical milling machine
  - 2. Describe the functions of the machine parts and controls
  - 3. Perform routine maintenance on the machine
- B. Cutting tools and cutter holders for the vertical milling machine
  - 1. Identify common cutters for the vertical mill
  - 2. Select a proper cutter for a given machining task
- C. Setups on the vertical milling machine
  - 1. Square the toolhead
  - 2. Setup and align a workpiece on the table
  - 3. Setup and align a mill vise
  - 4. Locate the edges of a workpiece relative to the spindle and position the spindle over a hole center
- D. Vertical milling machine operations
  - 1. Calculate feeds and speeds for end milling operations
  - 2. Identify and select vertical milling machine setups and operations for a variety of machining tasks
  - 3. Climb vs. conventional milling
- E. Plain and Universal Horizontal Milling Machines
  - 1. Identify the important components and controls on the horizontal milling machine
  - 2. Describe the functions of machine parts and controls
  - 3. Perform routine maintenance on the machine
- F. Types of Spindles, Arbors, and Adapters
  - 1. Identify machine spindles and setup different cutting tool mounting systems used to drive milling cutters
- G. Arbor driven milling cutters
  - 1. Identify common milling cutters, list their names, and select a suitable cutter for a given machining task
- H. Work holding methods and standard setups
  - 1. Select a work holding method and device for common milling tasks
  - 2. Safely setup a workpiece on the machine using common standard techniques
- I. Machine setup and plain milling
  - 1. Select speeds and feeds for several different materials and milling cutters
  - 2. Set up the mill for plain milling
  - 3. Select and set up a work holding system
  - 4. Select and set up an appropriate cutter and arbor
  - 5. Mill surfaces flat and square to each other

**LABORATORIES:**

- A. Analyzing the Vertical Spindle Milling Machine
  - 1. Identify the major components and controls on the vertical milling machine
  - 2. Try the functions of the machine parts and controls
  - 3. Perform routine maintenance on the machine
- B. Selecting cutting tools and cutter holders for the vertical milling machine
  - 1. Identify common cutters for the vertical mill
  - 2. Select a proper cutter for a given machining task

	<p>C. Setup the vertical milling machine</p> <ol style="list-style-type: none"> <li>1. Square the toolhead</li> <li>2. Setup and align a workpiece on the table</li> <li>3. Setup and align a mill vise</li> <li>4. Locate the edges of a workpiece relative to the spindle and position the spindle over a hole center</li> </ol> <p>D. Perform Vertical milling machine operations</p> <ol style="list-style-type: none"> <li>1. Calculate feeds and speeds for end milling operations</li> <li>2. Identify and select vertical milling machine setups and operations for a variety of machining tasks</li> <li>3. Try climb and conventional milling</li> </ol> <p>E. Analyze Plain and Universal Horizontal Milling Machines</p> <ol style="list-style-type: none"> <li>1. Identify the important components and controls on the horizontal milling machine</li> <li>2. Explore the functions of machine parts and controls</li> <li>3. Perform routine maintenance on the machine</li> </ol> <p>F. Analyze different types of Spindles, Arbors, and Adapters</p> <ol style="list-style-type: none"> <li>1. Identify machine spindles and setup different cutting tool mounting systems used to drive milling cutters</li> </ol> <p>G. Analyze Arbor driven milling cutters</p> <ol style="list-style-type: none"> <li>1. Identify common milling cutters, list their names, and select a suitable cutter for a given machining task</li> </ol> <p>H. Select and use work holding methods and standard setups</p> <ol style="list-style-type: none"> <li>1. Select a work holding method and device for common milling tasks</li> <li>2. Safely setup a workpiece on the machine using common standard techniques</li> </ol> <p>I. Setup for plain milling</p> <ol style="list-style-type: none"> <li>1. Select speeds and feeds for several different materials and milling cutters</li> <li>2. Set up the mill for plain milling</li> <li>3. Select and set up a work holding system</li> <li>4. Select and set up an appropriate cutter and arbor</li> <li>5. Mill surfaces flat and square to each other</li> </ol>
<p><b>Outcomes:</b> Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</p>	<p><b>Upon successful completion of this course, the student will be able to do the following:</b></p> <ol style="list-style-type: none"> <li>1. identify the major components of the vertical milling machine</li> <li>2. identify the major components of the horizontal milling machine</li> <li>3. demonstrate an ability to understand the use of different cutting tools and cutter holders for the vertical milling machine</li> <li>4. demonstrate an ability to understand the use of arbor driven milling cutters for the horizontal milling machine</li> <li>5. demonstrate an ability to understand setups for both the horizontal and vertical milling machines</li> </ol>
	<p><b>PROGRAM:</b> <i>(Numbering reflects Program Outcomes as they appear in the college catalog)</i></p> <ol style="list-style-type: none"> <li>7. demonstrate technical competency in a functional area of technology. The specialization may include, but is not limited to: electricity, computer aided drafting and design, manufacturing, and construction.</li> </ol>

	<p><b>GENERAL EDUCATION:</b> <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p>None</p>
<p><b>Evaluation:</b> List how the above outcomes will be assessed.</p>	<p><b>Assessment will be based on the following criteria:</b></p> <p>Quizzes Exams Laboratory Assignments</p>
<p><b>Instructional Resources:</b> List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</p>	<p><b>Required:</b></p> <p>Vertical Milling Machine Horizontal Milling Machine Cutting Tools Holders Spindles Holders Milling Material</p> <p><b>Desired:</b></p>
<p><b>Textbook(s)</b></p>	<p>Check with department chair for list of approved texts.</p>