

# COURSE SYLLABUS

<b>Course Title:</b>	CNC Maintenance & Repair I	<b>Date submitted:</b>	4/30/2018 (18-47)	
<b>Department:</b>	Advanced Manufacturing 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*162	<b>Prerequisites:</b> Successful completion of Electronics Technology Certificate or permission of the director of Manufacturing Technology  <b>Corequisites:</b> None  <b>Other Requirements:</b> None	
	<b>Course Type:</b>	X		
	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 FL: Foreign Language G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences M: Math S: Science SS: Social Science			
	<b>Credit Hours:</b>	3		
	<b>Developmental:</b> (yes/no)	No		
	<b>Contact Hours:</b>	Lecture:		2
		Clinical:		0
		Lab:		2
Studio		0		
Other:		0		
	<b>TOTAL:</b>	4		
<b>Class Maximum:</b>	24			
<b>Semesters Offered:</b>	Fall, Spring			
<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>	CNC Maintenance & Repair is a two semester course. CNC Maintenance & Repair I provides the student with an introduction to Computer Numeric Control [CNC] Machinery including the CNC Miller & CNC Lathe. Topics include: CNC Safety, Basic CNC Components, Basic Operations of a CNC, Overview of the Control Unit & Operator's Unit, CNC Part Programming, CNC Operation & Interfacing [PMC System], Measurement Devices, and Trouble Shooting Techniques. CNC Maintenance & Repair I is designed to give the student an in-depth overview of the design, programming, and operation of CNC machinery, thereby providing the foundation for CNC maintenance & repair.			

<p><b>Topical Outline:</b> List course content in outline format.</p>	<p>[The outline should be in title case and use the numbering format below. You may not have subtopics, but if you do, here is the format.]</p> <ol style="list-style-type: none"> <li>1. Introduction to CNC Systems</li> <li>2. Introduction to the control unit &amp; to the operator's unit</li> <li>3. Cartesian Coordinate System &amp; CNC Part Programming</li> <li>4. CNC/PMC Interface &amp; Operation</li> <li>5. PMC Ladder Program I/O Diagnostics</li> <li>6. CNC Controller Functions</li> <li>7. Measurement Devices</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> <p><b>COURSE:</b> Abilities should start with a measurable verb that students do. You do not need any punctuation at the end. Examples of some verbs you could use follow and more can be found at <a href="http://online.bcit.ca/guidelines/step2/Outclass.htm">http://online.bcit.ca/guidelines/step2/Outclass.htm</a> (Note: The examples below are cognitive abilities. See the website for others.)</p> <ol style="list-style-type: none"> <li>1. Demonstrate the ability to safely operate CNC equipment..</li> <li>2. Demonstrate a basic understanding of the CNC mill, lathe &amp; grinder.</li> <li>3. Demonstrate the ability to utilize the function/soft keys and to view the function screens.</li> <li>4. Demonstrate the ability to utilize the Manual Data Input [MDI] controls to enter basic commands.</li> <li>5. Demonstrate the ability to use correctly the manual pulse generator.</li> <li>6. Demonstrate a basic ability to use the operator panel to control operations on a CNC machine.</li> <li>7. Demonstrate the ability to identify the components of a CNC Part Program.</li> <li>8. Demonstrate the ability to enter correctly a part program into the CNC controller's memory</li> <li>9. Demonstrate the ability interact with the PMC control system menu.</li> <li>10. Demonstrate the ability to read, interpret, and modify a PMC ladder program.</li> <li>11. Demonstrate the ability to upload &amp; down load a ladder program utilizing remote devices and the controller.</li> <li>12. Demonstrate the ability to edit an existing ladder program using the MDI panel.</li> <li>13. Demonstrate the ability to identify &amp; explain the function of the major components of a CNC axis &amp; spindle control system.</li> <li>14. Demonstrate the ability to identify &amp; explain the automatic tool changer control system.</li> <li>15. Demonstrate the ability to utilize the operator's interface to monitor the CNC systems</li> <li>16. Demonstrate and understanding of several common measurement devices used in machine technology.</li> <li>17. Demonstrate the ability to use correctly part zero &amp; tool offset measurement devices.</li> </ol> <p><b>PROGRAM:</b> <i>Manufacturing Electro-Mechanical Maintenance Certificate and A.S. Degree</i></p> <p>[Any Program Abilities should be cut and pasted here as they appear in the current catalog, including numbers. Please note that MSWord may have numbered these automatically, so when you cut and paste, make sure the numbers are correct – you will need to make them “hard” numbers rather than auto numbers.]</p> <ol style="list-style-type: none"> <li>1. Demonstrate an understanding of Shop Safety.</li> </ol>

# CNC Maintenance & Repair I COURSE SYLLABUS — page 3

	<p>2. Demonstrate an understanding industrial manufacturing machinery and equipment.</p> <p>3. Demonstrate an understanding of industrial machine maintenance.</p> <p>4. Demonstrate an ability to troubleshoot industrial machinery.</p> <p>5. Demonstrate and ability to repair industrial machinery.</p> <p><b>GENERAL EDUCATION:</b> <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p><b>[Select the General Education Abilities from the listing below.]</b></p> <p><b>No General Education outcomes.</b></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>1. Tests and quizzes</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> Manufacturing lab including CNC equipment.</p> <p><b>Desired:</b> None</p>
<p><b>Textbook(s)</b></p>	<p>None</p>