

**Program Information Report**

**Machine Tool Programming (CNC) (CTMTP)**

**Certificate**

**Program Effective Term: Fall 2016**

In this program, students will learn to write, read, and edit programs for CNC machine tools. They will understand core canned cycles for milling and turning operations on CNC machine tools and have the skills to do 2D and 3D modeling and posting of CNC code using CAD/CAM software. Students completing this certificate will be able to create, edit, and debug code for local manufacturing companies.

**Program Admission Requirements:**

Completion of Machine Tool Setup and Operations certificate or comparable course or work experience. Academic Math Level 4 is required for NCT 121 and NCT 221.

<b>Major/Area Requirements</b>		<b>(Credits)</b>
NCT 120	Introduction to 2D CAD CAM Programming and Applications	2
NCT 121	Manual Programming and NC Tool Operation	4
NCT 123	2D CAD CAM CNC Programming for Mills and Lathes	2
NCT 221	Advanced Manual Programming and NC Tool Operation	4

**Minimum Credits Required for the Program: 12**

PROGRAM CHANGE OR DISCONTINUATION FORM

Program Code: CTMTP

Program Name: Machine Tool Programming (CNC)

Effective Term: Fall 2016

Division Code: ATP

Department: INTD Industrial Technology

**Directions:**

1. Attach the current program listing from the WCC catalog or Web site and indicate any changes to be made.
2. Draw lines through any text that should be deleted and write in additions. Extensive narrative changes can be included on a separate sheet.
3. Check the boxes below for each type of change being proposed. Changes to courses, discontinuing a course, or adding new courses as part of the proposed program change, must be approved separately using a Master Syllabus form, but should be submitted at the same time as the program change form.

**Requested Changes:**

- |   |   |
|---|---|
| <input type="checkbox"/> Review   | <input type="checkbox"/> Program admission requirements   |
| <input checked="" type="checkbox"/> Remove course(s): <u>NCT 249</u>          | <input type="checkbox"/> Continuing eligibility requirements  |
| <input checked="" type="checkbox"/> Add course(s): <u>NCT 120 and NCT 123</u> | <input type="checkbox"/> Program outcomes   |
| <input type="checkbox"/> Program title (title was _____)                      | <input type="checkbox"/> Accreditation information  |
| <input type="checkbox"/> Description  | <input type="checkbox"/> Discontinuation (attach program discontinuation plan that includes transition of students and timetable for phasing out courses) |
| <input type="checkbox"/> Type of award  | <input type="checkbox"/> Other _____  |
| <input type="checkbox"/> Advisors   |   |
| <input type="checkbox"/> Articulation information                             |   |

Show all changes on the attached page from the catalog.

**Rationale for proposed changes or discontinuation:**

Splitting NCT 249 into two courses, NCT 120 and NCT 123 to provide an opportunity for Welding students to take NCT 120.

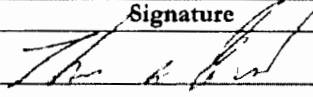
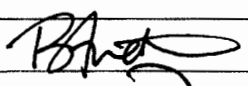
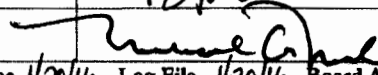
**Financial/staffing/equipment/space implications:**

Increase lecture hours by 15 and increase lab hours by 15

**List departments that have been consulted regarding their use of this program.**

Welding

**Signatures:**

Reviewer	Print Name	Signature	Date
Initiator	Thomas Penird		10/24/2015
Department Chair	Thomas Penird		
Division Dean/Administrator	Brandon Tucker		11/10/15
Vice President for Instruction	Michael Nealon		11/25/15

Do not write in shaded area. Entered in: Banner 4/20/16 C&A Database 4/20/16 Log File 4/20/16 Board Approval NA

Please submit completed form to the Office of Curriculum and Assessment and email an electronic copy to [sjohn@wccnet.edu](mailto:sjohn@wccnet.edu) for posting on the website.

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Office of Curriculum & Assessment

# Machine Tool Programming (CNC) (CTMTP)

Certificate

## Description

In this program, students will learn to write, read, and edit programs for CNC machine tools. They will understand core canned cycles for milling and turning operations on CNC machine tools and have the skills to do 2D and 3D modeling and posting of CNC code using CAD/CAM software. Students completing this certificate will be able to create, edit, and debug code for local manufacturing companies.

## Admissions Requirements

Completion of Machine Tool Setup and Operations certificate or comparable course or work experience. *Academic Math Level 4 is required for NCT 121 and 221*

## Contact Information

Division

Adv Tech/Public Serv Careers

Department

Industrial Technology Dept

Advisors

Thomas Penird

## Requirements

(Items marked in orange are available online.)

### Major/Area Requirements

Class	Title	Credits
<u>NCT 121</u>	Manual Programming and NC Tool Operation	4
<u>NCT 221</u>	Advanced Manual Programming and NC Tool Operation	4
<del>NCT 249</del>	<del>CAD/CAM CNC Programming</del>	<del>4</del>
Total		12
Total Credits Required		12

*NCT 120 CAD CAM for Shape Cutting 2*  
*NCT 123 CAD CAM CNC Programming for Mill or Lathes 2*

## Program Information Report

CTMTP

### School of Advanced Manufacturing Systems

Whether your interest is in manufacturing or automation, the programs in the School of Advanced Manufacturing Systems will fit your needs. Maintain and troubleshoot the machines that make commercial goods by specializing in one or more aspects of the machining industry. Develop entry level or advanced skills in electronics, automation hydraulics or numerical controls.

Washtenaw Community College offers programs at several levels for students who want to begin new careers, or advance in their existing careers. The first level is the certificate, which can vary from nine to thirty-six credits, depending on the field. Certificates generally prepare students for entry-level jobs.

After completing a certificate, students can progress to the next level, the advanced certificate. The credit hours required for these programs also vary. This type of certificate provides a more specialized level of skill development, and often allows students to upgrade their positions at their places of employment.

The next level, an Associate in Applied Science, is available for some programs. For some career fields, it is possible to earn a certificate, advanced certificate, and an Associate in Applied Science degree in the same field. In these cases, the credit hours from the certificate and advanced certificate can be applied to the credit hours needed for the Associate in Applied Science degree.

Alternatively, students can earn an AAS in Occupational Studies by completing a certificate, an advanced certificate (if one exists) and General Education requirements.

### Machine Tool

Learn about machining operations through the production of parts using WCC's extensive machine tool laboratory.

Program Information Report

Machine Tool Programming (CNC) (CTMTP)  
Certificate

Program Effective Term: Fall 2015

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Program Admission Requirements:

Completion of Machine Tool Setup and Operations certificate or comparable course or work experience.

Major/Area Requirements		
NCT 121	Manual Programming and NC Tool Operation	4
NCT 221	Advanced Manual Programming and NC Tool Operation	4
NCT 249	CAD/CAM CNC Programming	4

Minimum Credits Required for the Program: 12

**PROGRAM PROPOSAL FORM**

- Preliminary Approval** – Check here when using this form for preliminary approval of a program proposal, and respond to the items in general terms.
- Final Approval** – Check here when completing this form after the Vice President for Instruction has given preliminary approval to a program proposal. For final approval, complete information must be provided for each item.

<p><b>Program Name:</b></p> <p><b>Division and Department:</b></p> <p><b>Type of Award:</b></p> <p><b>Effective Term/Year:</b></p> <p><b>Initiator:</b></p>	<p>Machine Tool Programing (CNC )</p> <p><u>Advanced Technology and Public Services Careers/ Industrial Technology</u> Department</p> <p><input type="checkbox"/> AA   <input type="checkbox"/> AS   <input type="checkbox"/> AAS  <input checked="" type="checkbox"/> Cert.   <input type="checkbox"/> Adv. Cert.   <input type="checkbox"/> Post-Assoc. Cert.   <input type="checkbox"/> Cert. of Comp.</p> <p>Fall 2015</p> <p><u>Thomas Penird</u></p>	
<p><b>Program Features</b> Program's purpose and its goals. Criteria for entry into the program, along with projected enrollment figures. Connection to other WCC programs, as well as accrediting agencies or professional organizations. Special features of the program.</p>	<p>Students in this program will demonstrate competence in writing, editing, troubleshooting, and debugging CNC (computerized machining) code for manufacturing parts. Students learn 3D modeling and application of CAD/CAM software to produce machine tool code for CNC machine tools. This certificate is linked to the Mechatronics Program as one of the specialty tracks.</p>	
<p><b>Need</b> Need for the program with evidence to support the stated need.</p>	<p>Many of our students are only here to get specific training required by local industry. This is reflected in our completion numbers.</p> <p>Several students have asked for certification. Local employers would like the certification as an indication of the level of skill sets the potential employee has attained.</p> <p>We had eliminated the machine tool technology program from the Automation program (now Mechatronics).</p>	
<p><b>Program Outcomes/Assessment</b> State the knowledge to be gained, skills to be learned, and attitudes to be developed by students in the program. Include assessment methods that will be used to determine the effectiveness of the program.</p>	<p><u>Outcomes</u></p> <ol style="list-style-type: none"> <li>Code for programming machine tool motion resulting in desired part features.</li> <li>Troubleshoot, debug and edit programs to enhance productivity or part quality.</li> <li>Model and post machine tool paths using CAD/CAM Software.</li> <li>Design and build mechanisms to hold parts.</li> </ol>	<p><u>Assessment method</u></p> <ol style="list-style-type: none"> <li>Capstone Projects</li> <li>Capstone Projects</li> <li>Software Quizzes</li> <li>Capstone projects</li> </ol>

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<p><b>Curriculum</b></p> <p>List the courses in the program as they should appear in the catalog. List minimum credits required. Include any notes that should appear below the course list.</p>	<p>NCT 121 4Cr Manual Programming NC Tools  NCT 221 4Cr Advanced Manual Programming NC Tools  NCT 249 4Cr CAD CAM  12 credits</p> <p><b>These are all existing courses</b></p>																							
<p><b>Budget</b></p> <p>Specify program costs in the following areas, per academic year:</p>	<table border="1"> <thead> <tr> <th></th> <th>START-UP COSTS</th> <th>ONGOING COSTS</th> </tr> </thead> <tbody> <tr> <td><b>Faculty</b></td> <td>\$ 0.0</td> <td>\$ .</td> </tr> <tr> <td><b>Training/Travel</b></td> <td>0.0</td> <td>.</td> </tr> <tr> <td><b>Materials/Resources</b></td> <td>.</td> <td>.</td> </tr> <tr> <td><b>Facilities/Equipment</b></td> <td>.</td> <td>.</td> </tr> <tr> <td><b>Other</b></td> <td>.</td> <td>.</td> </tr> <tr> <td><b>TOTALS:</b></td> <td>\$ .</td> <td>\$ .</td> </tr> </tbody> </table>				START-UP COSTS	ONGOING COSTS	<b>Faculty</b>	\$ 0.0	\$ .	<b>Training/Travel</b>	0.0	.	<b>Materials/Resources</b>	.	.	<b>Facilities/Equipment</b>	.	.	<b>Other</b>	.	.	<b>TOTALS:</b>	\$ .	\$ .
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<p><b>Program Description for Catalog and Web site</b></p>	<p>In this program, student will learn to write, read and edit programs for CNC machine tools. They will understand core canned cycles for milling and turning operations on CNC machine tools and have the skills to do 2D and 3D modeling and posting of CNC code using CAD/CAM software. Students completing this certificate will be able to create, edit and debug code for local manufacturing companies.</p>																							
<p><b>Program Information</b></p>	<p><b>Accreditation/Licensure -</b>  <b>Advisors -</b>  <b>Advisory Committee -</b>  Norgren: Mike Rodocker, Josh Jeffers  Zero Hour Parts: Brandon Hoag, Debra Adams, MS PHR  Faurecia: Wes Nichols  Mechanized Numerics LLC: Andrew Dubuc  L&amp;W Engineering: David Braun  Jacobs Technologies: Ed Grabow  Heller Precision Machining: Jason Barnhart, Chris Wehrle</p> <p><b>Admission requirements – Completion of Machine Tool Setup and Operations certificate or comparable courses or work experience.</b></p> <p><b>Articulation agreements -</b></p> <p><b>Continuing eligibility requirements -</b></p>																							

**Assessment plan:**

Program outcomes to be assessed	Assessment tool	When assessment will take place	Courses/other populations	Number students to be assessed
1. Code for programming machine tool motion resulting in desired part features.	Capstone Project	Fall 2016	NCT 221	All
2. Troubleshoot, debug and edit programs to enhance productivity or part quality.	Capstone Project	Fall 2016	NCT 221	All
3. Model and post machine tool paths using CAD/CAM Software.	Software Quiz	Fall 2016	NCT 249	All
4. Design and build mechanisms to hold parts,	Capstone Project	Fall 2016	MEC201	All

**Scoring and analysis plan:**

1. Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally-developed rubric, external evaluation, other). Attach the rubric.


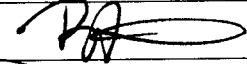
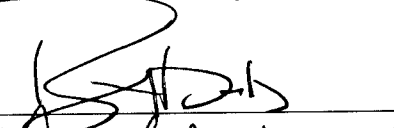

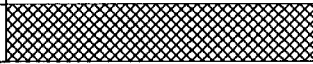

Outcomes 1 – 4: Departmentally- developed rubrics

2. Indicate the standard of success to be used for this assessment.

Outcomes 1 – 4: 75% of the students will score 70% or better.

3. Indicate who will score and analyze the data.

Department Faculty

REVIEWER	PRINT NAME	SIGNATURE	DATE
Department Chair/Area Director	Thomas Penird	Penird 	1/6/2015
Dean	Brandon Tucker	Tucker 	1/6/15
Vice President for Instruction <input type="checkbox"/> Approved for Development <input type="checkbox"/> Final Approval	William Abernethy		2/5/15
President	Rose Bellanca		2/23/15
Board Approval			3/24/15