

# MACHINING AND CNC TECHNOLOGY (ATC)

## Advanced Technical Certificate

### Career-Technical Program

#### Interest Areas:

**Manufacturing and Trades**

This program prepares students for entry-level employment in the machining and manufacturing industries. The curriculum features basic to advanced machining concepts involving various machine tools such as conventional lathes, mills, grinders, and their Computer Numerical Control (CNC) counterparts. Coursework also involves blueprint reading, geometric dimensioning and tolerancing, shop math, and statistical and mechanical measurements. The second year of the program places emphasis in CNC and CAD/CAM systems as well as geometric dimensioning and tolerancing in preparation for employment in the computerized manufacturing environment.

Successful completion of each semester or permission of the instructor is required to continue into the next semester. Prospective students should have solid math skills and demonstrate mechanical aptitude. Computer and keyboarding skills are recommended. Placement in specific English and Math classes is determined by the college assessment test.

**Current industry professionals may enroll in individual courses on a space-available basis and with the instructor's permission.**

#### Contact Information:

**Trades & Industry Division  
Parker Technical Education Center  
7064 West Lancaster Road  
Rathdrum, ID 83858  
Phone: (208) 769-3448**

Program Website (<https://www.nic.edu/programs/machining-and-cnc-technology/>)

## Program Requirements

Course	Title	Credits
<b>Semester 1</b>		
MACH-150	Machining Technology Theory I	6
MACH-151L	Machining Technology Lab I	6
MACH-171	Blueprint Reading	2
MCTE-105	Technical Mathematics for Machining and Computer Aided Design Technologies	3
<b>Credits</b>		<b>17</b>
<b>Semester 2</b>		
MACH-152L	Machining Technology Lab II	5
MACH-160	Manufacturing Processes	4
MACH-172	Blueprint Reading II	2
ATEC-117	Occupational Relations and Job Search	2
ENGL-101 or ENGL-101P	Writing and Rhetoric I or Writing and Rhetoric I	3
<b>Credits</b>		<b>16</b>

<b>Semester 3</b>		
MACH-234	Computers in Machining	2
MACH-253L	Computer Numerical Control Lab	5
MACH-283	Computer Numerical Control	5
<b>Credits</b>		<b>12</b>
<b>Semester 4</b>		
MACH-254L	Advanced Computer Numerical Control Lab	5
MACH-274	Geometric Dimensioning and Tolerancing	3
MACH-284	Advanced Numerical Control	5
<b>Credits</b>		<b>13</b>
<b>Total Credits</b>		<b>58</b>

## Program Outcomes

Upon completion of the program, students will be able to:

1. Illustrate shop terms, language, and vocabulary to describe processes and methods as well as the machinery, their accessories and use.
2. Interpret various views, lines, symbols, terms, and abbreviations routinely used on blueprints in the manufacturing industry.
3. Strategize and develop detailed and effective manufacturing processes from a blueprint, engineering sketch, related documents, or verbal instructions and executing these processes on conventional and computerized machine tools.
4. Perform basic and advanced mechanical measurements using proper technique and equipment, and develop process corrections based upon measured observations.
5. Demonstrate capable navigation of CNC machine controls as well as compose and employ machine code (G-Code) to dictate and manipulate CNC machine tool motion.
6. Analyze and interpret admissible feature tolerances provided on geometric dimension and tolerancing (GD&T) blueprints to Y14.5 American Society of Mechanical Engineers (ASME) Standards.
7. Produce 3D models and develop practical NC code applying CAD/CAM software to CNC lathe and CNC mill toolpaths.
8. Compare and employ complex CNC machine tools such as EDM, screw machines, 5-axis and mill-turn machines.