

# PRECISION MACHINING/CNC TECHNOLOGY, Certificate – (Noncredit)

Office of Workforce Development and Continuing Education/Industrial/Manufacturing

CIP Code: 159999

This 336-hour course is designed to teach students how to interpret blueprints, perform shop math calculations, work with precision measurements and measuring tools, set-up and complete projects on both traditional lathes and mills as well as Computer Numerical Control (CNC) machines, perform basic and advanced machining operations, and make decisions to ensure that work quality is maintained.

The curriculum is designed to prepare students for employment in entry-level positions, such as machine setup, operation, and programming while providing the fundamental knowledge and skills required to become an expert Machinist. This training also teaches students attention to detail, the ability to work to close tolerances, the skills to improve their mechanical aptitude, and how to solve mechanical challenges by working through logical steps. Shop safety, including OSHA-10 Certification Training, and good shop work practices, including routine machine shop maintenance activities are also covered. The tuition for this class covers designated reading materials and lab fees and a student tool kit. This training can be completed at the Harrisburg-Midtown 1 Campus provided that students take some of their coursework through multiple modalities (e.g. Online, Blended and/or Remote Learning). For more information, please contact [haccmfg@hacc.edu](mailto:haccmfg@hacc.edu). **Customization and industry training options are also available.**

## Career Opportunities

This course prepares individuals for employment in various entry-level positions, such as CNC Setup, CNC Programmer, a CNC Operator, Quality Control Specialist, Industrial Manufacturing Technician, Production Technician, or entry-level Machinist.

## Competency Profile

This curriculum is designed to prepare the student to:

- Demonstrate measuring skills and proper usage of precision measurement tools: Vernier calipers, sine bar, micrometer, height gage, gage block, dial indicator and comparator
- Read and interpret industrial blueprints for part and component fabrication or assembly
- Create basic CNC programs for milling and turning from part schematics
- Setup conventional and automated mills and lathes
- Describe common “G” and “M” codes and their functions
- Select proper tools, speeds, and feeds to machine a part
- Demonstrate safe machine shop practices
- Complete the OSHA-10 Hour safety training for general industry
- Demonstrate basic knowledge of SolidWorks design software and the application’s functions. Learn the relationships between MasterCAM™ and SolidWorks™
- Identify and correct the quality control issues commonly found within the manufacturing process

## PROGRAM REQUIREMENTS

Interested students will display a mechanical aptitude and ability to operate the required tools in a safe and effective manner.

## RECOMMENDED SEQUENCE

The complete Precision Machining/CNC Technology Certificate Course comprises the following courses: Precision Machining, CNC Operator, CNC Programmer. 336 Hours – 38 Lecture Hours / 161 Lab Hours / 137 Online Hours. Interested students are advised to enroll in and complete the entire course, but for those with a specific focus or interest, these classes can also be taken separately.

### IAMW 012 Precision Machining 112 hours

- Soft Skills / Employee Readiness Skills
- Shop Math
- Shop Measuring Skills
- Print Reading for Machinists
- Introduction to Lean Manufacturing
- Machine Shop Safety
- Machine Shop Skills

### IAMW 011 CNC Operator 84 hours

- CNC – Milling and Turning
- Introduction to SolidWorks™
- Creating a Part
- Creating an Assembly
- Creating Drawings
- Engineered Tasks

### IAMW 023 CNC Programmer 140 hours

- Manufacturing Design
- CNC Programming Systems
- Solidworks and MasterCAM 2D
- CNC Mill Setup
- CNC Lathe Programming and Setup
- CNC Projects