Engineering & Metal Fabrication: Machining

Western Monroe & Orleans Counties
WEMOCO
Career & Technical Education Center

Explore product development from concept to consumer

Students gain a global understanding of precision machining, the process of removing metal to create extremely accurate parts. They learn all aspects of the advanced manufacturing industry, including how to operate CNC (Computer Numerical Controlled) lathes, mills and power saws. The creation of blueprints and designs using industry-driven software and technology is covered, as is performing quality control and inspections. Students will also be exposed to basic welding.

Units of Study

- OSHA 10 hour course
- Safety
- Power saws
- Manual machining Mill/Lathe
- CNC (Computer Numerically Controlled)
- CAD (Computer Aided Design)
- CAM (Computer Aided Manufacturing)
- Metallurgy
- 3-D printing
- GD&T (Geometric Dimensioning and Tolerancing)

Integrated Academics

- English
- Math

Licensing / Industry- Based Certifications

OSHA 10 Construction

College Credits

MCC Dual Enrollment:

- TAM 101: Machine Theory I
- TAM 121: Mathematics for Machinists
- TAM 131: Machine Shop Print Reading I
- TAM 141: Machine Shop Laboratory

Work-Based Learning

CTE programs bring students into the workplace for real life experiences. Businesses that support our Machining program:

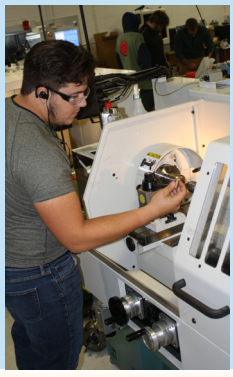
- SPX Flow
- Micro Inc.
- Boss Precision
- Brinkman
- Machine Tool Research
- Kodak
- Acro
- Alliance Precision Plastics

Explore more:

https://www.onetonline.org/find/
https://www.careerzone.ny.gov/

Articulation Agreements

SUNY Canton



Career Paths

All CTE programs correlate to many career paths.

↓ Start Here

- CNC Operator
- Mill Operator
- Lathe Operator

Go Here ↓

with more education & experience

- Programmer
- Engineer
- Manufacturing Manager

Explore more:

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WEMOCO Career & Technical Education Center
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Your Educational Partner of Choice
BOCES 2

Engineering & Metal Fabrication: Machining

Employability Profile

Work-Related Skills

Productivity and Accountability

Follows procedures to meet expectations and deadlines

Displays consistent work performance and quality of work

Flexibility and Adaptability

Works effectively in varied roles and responsibilities

Responds well to and implements feedback

Initiative and Self-Direction

Identifies, prioritizes, and completes tasks without direct oversight

Seeks to learn and develop new knowledge and skills

Leadership and Responsibility

Leverages strengths of others to accomplish a goal

Takes ownership of one's work, performance, behavior, and actions

Communication

Articulates thoughts and ideas clearly and effectively through speaking and writing

Practices active listening skills

Collaboration

Works effectively with others

Open and responsive to new and diverse perspectives

Critical Thinking and Problem Solving

Asks questions to lead to better solutions

Identifies possible options and their outcomes

Engineering and Blueprint Skills

Use Computer Aided Design (CAD) software

Setup and program in Computer Aided Manufacturing (CAM) software

Interpret blueprints and procedures

Interpret blueprint Geometric Dimensioning and Tolerancing (GD&T)

Manufacturing Skills

Identification and proper use of bench work tools

Layout of a part based on blueprints

Applies proper speeds and feeds to every process (Cuts? Should processes be defined?)

Metallurgy – identify metals, hardness, and understand the applications for different metals

Manual Lathe

Setup and use

Facing and turning

Knurling and tapers

Single point threading

Manual Mill

Setup and use

Indicating a vice

Tramming a head

Squaring a block

Drilling

Edge finding

Edge finding

CNC Lathe

Setup and use

Manual programming G code

Editing code

Use of Computer Aided Manufacturing (CAM)

Trouble shooting set ups (run-out, mismatch, etc)

CNC Mill

Setup and use

Manual programming G code

Editing code

Use of Computer Aided Manufacturing (CAM)

Trouble shooting set ups (un-square, mismatch, etc)

Grinding and Cutting

Surface grinding to a specific tolerance or finish

Use of a pedestal grinder

Quality Control

Identification and proper use of measuring tools: tape, rule, dial indicators, micrometers, verniers, protractors, and levels

Use optical comparators

Verify Geometric Dimensioning and Tolerancing (GD&T) of a part

Use holding and positioning devices for measurement verification