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:

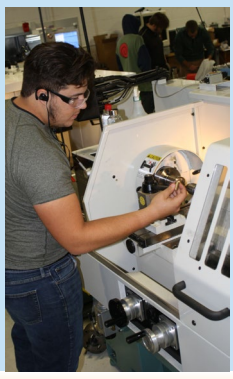
- SPX Flow
- Micro Inc.
- Boss Precision
- Brinkman
- Machine Tool Research
- Kodak
- Acro
- Alliance Precision Plastics

Explore more:

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

Articulation Agreements

SUNY Canton



Career Outlook

All CTE programs correlate to many careers paths. Use the links below to explore more. One example:

Job Projections for Machinists: 5% projected growth in New York State jobs 2016-2026.

New York State salary range:
$31,730 entry level- $54,590 experienced

Education Requirements: Training or apprenticeship programs, career and technical education schools, or community and technical colleges. Additional courses beyond high school are often required.

Explore more:

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

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Employability Profile

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Career Readiness

- Attendance _____
- Punctuality _____
- Appropriate Workplace appearance _____
- Takes Initiative _____
- High Quality of work _____
- Knowledge of workplace ethics _____
- Responsive to supervisor _____
- Effective Communication skills _____
- Solves problems _____
- Makes decisions _____
- Cooperates with others _____
- Resolves conflict _____
- Observes critically _____
- Takes responsibility for learning _____
- Reads with understanding _____
- Solves problems using math _____
- Complies with health and safety rules _____
- Uses technology appropriately _____

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 _____

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 _____