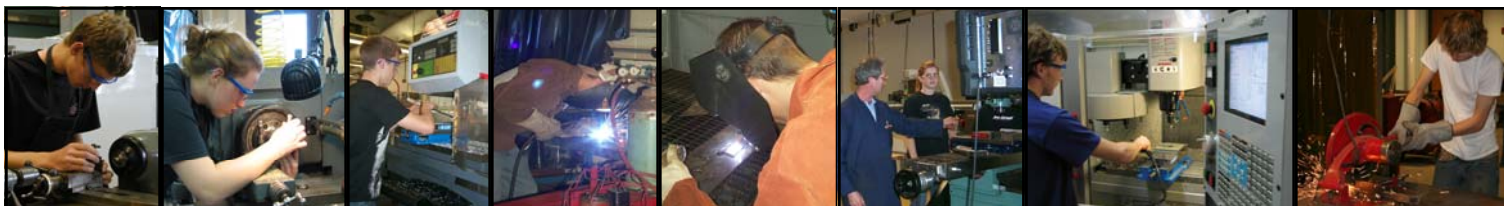


Our competency-based **Machining and Welding** Program is a unique blend of two professions. The goal of this program is to help students develop job readiness skills relative to the welding and machining occupations. Good work ethics and employable skills are taught through classroom theory and shop activities. During the first year of our program, students learn the basic theory and skills of both welding and machining through required classroom and shop activities. Measurement, blueprint reading, layout, machine setup and operation of various types of welders and machines are all studied and applied. Required activities and projects act as a curriculum core in order for students to learn the fundamentals of these occupations. Once core requirements are completed, individual projects are encouraged to expand on these skills. Second year students have the opportunity to specialize in either the machining or welding portion of the program. Students will continue to develop their knowledge and ability through advanced trade applications in the occupation of their choice. In welding, students will focus on different types of welding procedures, as well as basic design and fabrication skills using pipe benders, rollers, brakes and shears. In machining, students will expand on their current machine operations and setup skills, along with CNC programming and operation using “Mastercam” software, Haas CNC lathes and vertical machining centers.



Program Content...

FIRST YEAR

WELDING

- Blueprint Reading
- Oxy-Acetylene cutting, welding and brazing
- MIG welding carbon steel
- Arc welding carbon steel
- Cutting and shearing techniques
 - a) bandsaw
 - b) abrasive cutoff saw
 - c) 10 gage shear
 - d) 35 ton iron worker

MACHINING

- Blueprint Reading
- Basic math and linear measurement
- Setup and operation of the following:
 - a) drill press
 - b) bandsaw
 - c) grinders
 - d) lathes
 - e) milling machines
- CNC (Computer Numerical Control) machine operation

SECOND YEAR

WELDING

- More advanced welding techniques
 - a) Designing and using basic Jigs and fixtures
 - b) Out of position welding
 - c) Focusing on Arc, MIG and TIG welding
 - d) Basic fabrication techniques
- Welding aluminum and stainless steel
 - a) With MIG
 - b) With TIG
- Plasma Arc Cutting setup and operation
- Oxy-Acetylene setup and cutting techniques

MACHINING

- Advanced measurement techniques and instruments
- Advanced lathe and mill operations
 - a) Internal threading, grooving, and boring
 - b) Precision machining and grinding
 - c) Developing production machining & fabrication processes
- Finishing and Inspection
 - a) Surface grinding
 - b) Finish quality and instruments
- CNC - Computer Numerical Control
 - a) Manual programming CNC lathes and mills
 - b) CAM programming CNC lathes and mills
 - c) CNC setup and operation of lathe and mill

Students will study and practice fundamental metal working operations used in industry today. They will be required to do individual exercises and projects in order to demonstrate their understanding & competence in the above areas. Once these are completed, individual projects are encouraged.

Some past projects have been engine stands, jack stands, ramps, docks, & trailers. Students have repaired or remanufactured parts for cars, trucks, motorcycles, snowmobiles, 4 wheelers & lawn mowers.

The course curriculum will be presented by classroom instruction, shop activities and industrial tours. Students will visit local industry and see how the computer and CNC equipment has dominated today's manufacturing.

Internship Experiences...

Students can participate in an internship experience where they will apply their knowledge while working with professionals in authentic career settings. Students will have an opportunity to dialog with practitioners via guest presentations while developing professional insights and future educational plans.

Benefits...

Articulation Agreements/College Credit

- Cayuga Community College
- Art Institute of Pittsburgh
- Pennsylvania College of Technology

Completed Career Portfolio

Integrated Math Credit

Portfolio...

All second year students will complete a Career and Technical Education Portfolio that exhibits necessary elements for CTE Endorsement and demonstrates competencies in Machining & Welding.

Machining & Welding could lead to careers in...

MACHINING

- General Machinist
- Apprentice Tool & Die Maker
- CNC Operator
- Inspection
- CNC Programmer*
- Setup/Troubleshooter*
- Tool & Die Maker*
- Mechanical Engineer*
- Industrial Engineer*
- CAD Programmer*

WELDING

- Welder's Helper
- DOT Certified Welder
- MIG Welder
- TIG Welder
- Fabricator
- Pipe Welder*
- Pipefitter/Steamfitter*
- Certified TIG Welder*
- Mechanical Engineer*
- HVAC Technician*
- Industrial Engineer*

*Advanced Employment - Additional training may be necessary

For more information, contact ...

Your High School Guidance Office or
The Guidance Office at the **BOCES**

Cayuga-Onondaga BOCES
1879 W. Genesee Street Road
Auburn, NY 13021
315.253.0361
www.caybores.org

Students enrolling in this program will be responsible for a small toolbox, 8" leather work boots and a shop apron.

No student shall on the basis of gender, race, color, national origin, disability or age, be excluded from participation in, be denied the benefits of or otherwise be subjected to unlawful discrimination under any career and technical program or activity.