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

Internship Sites

Ace Precision Tool
Auburn Tank
Barber Welding
CamTech Mfg.
Dynoport
Fingerlakes Automotive
Hood R.G. Welding
Ide Machine
Weaver Machine and Tool
Welch Allyn

No More Barriers...Did you know . . .
Both males & females have the same abilities to perform mechanical and mathematical activities.

Gender won't get you the job…
SKILLS and QUALIFICATIONS will…

Qualifying students may participate in an offsite industrial internship lasting from one to ten weeks. A student will be placed in a local industry work site where they will work with skilled craftsmen applying the skills they have learned in the classroom.

How do I enroll?

See your High School Guidance Office
Or
Guidance Office
Cayuga-Onondaga BOCES
315.253.0361

6/09

Cayuga-Onondaga BOCES

Machining & Welding

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Machining & Welding....A Blueprint to Your Future.

Our competency-based Machining and Welding (CAM) 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. These skills help students to directly enter the workforce, the military and/or continue their education at a two or four year school.

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.

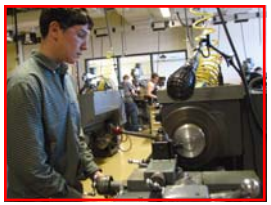
Second year students have the opportunity to specialize in either the machining or welding portion of the program. Students will continue to develop their knowledge and ability through advanced trade applications in the occupation of their choice. In welding, students will focus on different types of 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.

Second year students are eligible for internship placement in a local industry. Internships are from one to ten weeks long, structured to increase knowledge, skill, and job readiness for the students. Dual credit courses are also available for students. This is an opportunity for high school students to enroll in a college course and receive official college credit. Students get a "taste" of college expectations while still in high school. *Students who successfully complete* the collaborative secondary/post secondary program will receive SUNY transcript credit for course **ENGR 103** (Manufacturing Materials and Processes).

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

Program Content

First Year Program



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

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 and competence in the above areas. Once these are completed, individual projects are encouraged. Some past projects have been engine stands, jack stands, ramps, docks, and trailers. Students have repaired or remanufactured parts for cars, trucks, motorcycles, snowmobiles, 4 wheelers and lawn mowers.

Second Year Program

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

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.

Machining & Welding