

# WELDING I & II

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## COURSE OBJECTIVE

Students will learn and practice welding skills and techniques used in the industry in accordance with American Welding Society (AWS) standards.

## COURSE DESCRIPTION

This course prepares students for a career in Welding. The course has a high concentration of many welding applications. Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), Flux Cored Arc Welding (FCAW), Plasma Arc Cutting (PAC), Oxy-Acetylene Cutting (OAC), Oxy-Acetylene Welding (OAW) and Brazing (B) are taught throughout the program. Students are also taught welding safety, how to use different measuring devices, electrical principals, grinding, the use of various hand tools, layout as it applies to fabrication, making a bill of materials and cost estimation, metallurgy, blueprint reading and welding symbols. Students will be given the opportunity to earn AWS and ASME welding certifications. All welding certification will be done by a Certified Welding Inspector (CWI).

## COURSE TOPICS

Shielded Metal ARC Welding (SMAW) | Gas Metal ARC Welding (GMAW) | Gas Tungsten ARC Welding  
Flux Cored Arc Welding (FCAW) | OSHA | Oxy-Acetylene Welding (OAW) | Brazing (B)  
Manual and Semiautomatic Plasma Arc Cutting (PAC) | Oxy-Acetylene Cutting (OAC)

## REQUIRED SUPPLIES

Chipping Hammer | Cutting Glasses with #5 Shade Lens | Grinding Faceshield  
Leather Work Boots (Steel Toed Required) | Mig Pliers Safety Glasses | Respirator/Facemask (Opt.)  
Shop Shirt (Navy Tee) | Slip-Notch Pliers | Tape Measure | Vise Grips | Welder's Cap  
Welding Gloves/Helmet/Jacket | Welding Sleeves | Wire Brush | Workwear Pants (Navy)

**NOTE:** Each student is to have their own equipment. Equipment may need to be replaced as the school year progresses.

## TEXTBOOKS

*Welding Skills*; B. J. Moniz

## COOPERATING COMPANIES

AccuTrex	Lincoln Electric	SMS Millcraft
Airgas–Washington, PA	Maxwell Welding & Machine	Steam Fitters Union Local 449
Consol Energy	Range Resources	
Dynamet, Inc.–Washington, PA	Sky Oxygen	

## **SPECIALIZED SHOP EQUIPMENT**

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CNC Plasma Table | Inverter Technology GMAW | Inverter Technology SMAW | Ironworking  
Shear/Press/Punch | Square Wave GTAW

## **CERTIFICATIONS**

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American Welding Society-AWS D1.1–(Structural Code)  
American Welding Society-AWS D1.5–(PA Department of Transportation Code)  
ASME Information–(Pressure Vessel Code), (ASME Boiler & Vessel Code)  
CareerSafe OSHA

## **ARTICULATION AGREEMENTS**

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Community College of Allegheny County  
Penn Commercial, Inc.  
Pittsburgh Technical College

## **POST-SECONDARY TRAINING OPTIONS**

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Community College of Allegheny County  
Hobart Institute of Welding Technology  
Lincoln Electric  
Penn Commercial, Inc.–Welding  
Pennsylvania College of Technology  
Pittsburgh Technical College–Welding  
Triangle Tech, Inc.  
Welder Trainer and Testing Institute

## **POTENTIAL CAREERS**

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Boilermaker | CNC Plasma Operator | Ironworker | Maintenance Welder | Metal Fabricator  
Metallurgist | Pipe Welder | Ship Builder | Steamfitter | Underwater Welder  
Welding Engineer | Welding Inspector | Welding Instructor | Welding Sales | Welding Technician

## **WELDER SKILLS**

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**Equipment Selection** — Determining the kind of tools and equipment needed to do a job.

**Quality Control Analysis** — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

**Equipment Maintenance** — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

**Installation** — Installing equipment, machines, wiring, or programs to meet specifications.

**Mathematics** — Using mathematics to solve problems.

**Operation and Control** — Controlling operations of equipment or systems.

**Repairing** — Repairing machines or systems using the needed tools.

**Reading Comprehension** — Understanding written sentences and paragraphs in work related documents.

## **WAGES AND EMPLOYMENT TRENDS FOR WELDERS, CUTTERS, SOLDERERS & BRAZERS**

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Median Wages (2020)	\$21.25 Hourly, \$44,190 Annually
Number of Jobs (2019)	438,900 Employees
Job Outlook (2019-2029)	3% (As Fast as Average)
Employment Change (2019-2029)	13,600

Source: *Occupational Outlook Handbook*

WESTERN AREA CAREER & TECHNOLOGY CENTER  
**WELDING**  
2021-2022 Shop Requirements

Shop Uniform/Accessories

- Chipping Hammer
- Cutting Glasses, #5 Shade Lens
- Grinding Face Shield
- Hat with Shop Logo (Optional)
- Leather Work Boots (Steel-Toed Required)
- Mig Pliers
- Tee Shirt, Navy, Short or Long Sleeve (Use Enclosed Order Form)
- Respirator/Facemask (Optional)
- Safety Glasses (First Pair Provided by Western Area CTC)
- Slip-Notch Pliers
- Vise Grips
- Welder's Cap
- Welding Jacket, Helmet and Gloves
- Welding Sleeves
- Wire Brush
- Workwear Pants (Navy) or Blue Jeans (*No Rips, No Tears, No Holes*)
- 12-25 ft. Tape Measure

**APPROXIMATE COST: \$250**

Welding caps, jackets, helmets, gloves and sleeves are available at any local welding supply shop. Order uniform tee shirts and hats by mailing the enclosed order form to TNT Manufacturing or by ordering online at [companycasuals.com/WACTC](http://companycasuals.com/WACTC). All orders are delivered to Western Area and will be distributed to students after the start of the school year.

Lost or broken safety glasses may be replaced throughout the year in the Main Office. Cost is approximately \$3. Lockers are provided for students to change out of street clothes into their uniform. Locks must be purchased from WACTC; cost is approximately \$6.

Clinical activities/learning situations require that any body piercings be removed and any tattoos covered.

Students may be required to wear professional clothing for vocational student organization conferences, competitions and meetings.

**All criteria is subject to change.**