

Content and/or textbook subject to change without notice

Pennsylvania College of Technology

Workforce Development & Continuing Education

Welding - Basic TRS 178 Course Outline

- Course Description:** Learn the four basic welding processes of oxy-fuel, shielded metal arc, gas metal arc, and gas tungsten arc welding. **This course can be tailored to individual needs with prior approval of the instructor.** Safety will be stressed. Basic skills will be developed through hands-on practice.
- Textbook:** Welding: Principles and Applications
- Prerequisites:** None
- Course Length:** 40 hours
- Course Objectives:** Develop basic skills in welding safety and general knowledge of welding varieties

Course Outline:

- + **Introduction to Welding**
 - Welding defined
 - Uses of welding
 - Welding & cutting processes

- + **Safety in Welding**
 - Face, eye & ear protection
 - Respiratory protection
 - Ventilation
 - Material safety data sheets (MSDS)
 - General work clothing
 - Special protective clothing
 - Handling & storing cylinders
 - Fire protection
 - Equipment maintenance
 - Work area
 - Hand tools
 - Electrical safety
 - Metal cutting machines

- + **Shielded Metal Arc Welding**
 - Welding current
 - Electrode size & heat
 - Arc-length
 - Electrode angle

- Positioning of the welder & plate
- Weld joints
 - square butt joint
 - edge weld
 - outside corner joint
 - lap joint
 - tee joint

+ Gas Metal Arc Welding

- Weld metal transfer methods
- Wire melting & deposition rates
- Speed of the wire electrode
- Molten weld pool control
- Travel speed
- Electrode extension
- Gun angle

+ Gas Tungsten Arc Welding

- Tungsten
- GTA welding equipment
- Types of welding current
- Shielding gases
- Preflow & postflow
- Shielding gas flow rate

+ Oxy-Fuel Welding

- Introduction
- Pressure regulators
- Regulator safety precautions
- Welding & cutting torches
- Mixing the gases
- Welding & heating torch tips
- Hoses & fittings
- Types of flames
- Manifold systems