

## WELDING I & II

**Program Description:** The Welding course of study provides students with an opportunity to learn about the industry as it relates to welding. Students will master a variety of welding competencies including oxyfuel cutting and welding including shielded metal arc welding. Program standards are aligned to the requirements of the American Welding Society (AWS) for a Level I entry level welder. Prior to performing any welding in the lab, students will be required to pass the AWS basic safety module. All students are required to wear protective clothing and gear when working in the welding lab.

### Module 1: Safety and Health of Welders

**Unit Objective:** Students will describe and demonstrate proper welding shop safety.

**Unit Competencies:**

1. Demonstrate proper use and inspection of personal protection equipment (PPE).
2. Demonstrate proper safe operation practices in the work area.
3. Demonstrate proper use and inspection of ventilation equipment.
4. Demonstrate proper Hot Zone operation.
5. Demonstrate proper work actions for working in confined spaces.
6. Demonstrate proper use of precautionary labeling and MSDS information.
7. Demonstrate proper inspection and operation of equipment used for each welding and thermal cutting process.

### Module 2: Drawing and Welding Symbol Interpretation

**Unit Objective:** Students will be able to read and interpret symbols and plans utilized in the Welding industry.

**Unit Competencies:**

1. Interpret basic elements of a drawing or sketch.
2. Interpret welding symbol information.
3. Fabricate parts from a drawing or sketch.
4. Read and interpret blue prints.
5. Understand and apply math skills as they relate to welding

### Module 3: Shielded Metal Arc Welding (SMAW)

**Unit Objective:** Students will demonstrate competency in shielded metal arc welding.

**Unit Competencies:**

1. Identify the principles of and set-up.
2. Demonstrate basic welding applications.
3. Critique, practice and demonstrate tacking, running bead and weaves.
4. Demonstrate position and out-of-position.
5. Demonstrate welding common metals.
6. Assess, and demonstrate welding in advanced positions.
7. Demonstrate fabrication of welding joints, fillet welds and groove welds.

#### **Module 4: Gas Metal Arc Welding (GMAW)**

**Unit Objective: Students will demonstrate competency in metal inert gas welding.**

**Unit Competencies:**

1. Describe the principles of set-up.
2. Describe and demonstrate basic joints.
3. Demonstrate spray, globular and short-arc techniques.
4. Describe and demonstrate proper metal inert gas welding safety.
5. Demonstrate fillet welds and groove welds in all positions.

#### **Module 5: Flux Cored Arc Welding (FCAW)**

**Unit Objective: Students will demonstrate competency in flux cored arc welding.**

**Unit Competencies:**

1. Interpret the principles of set-up for wire feed welding.
2. Demonstrate metal preparation.
3. Evaluate and demonstrate tacking techniques.
4. Demonstrate fillet welds and groove welds in all positions.

#### **Module 6: Oxyfuel Cutting (OFC)**

**Unit Objective: Students will describe how the effects of heat, metal thickness and metal length influence welding/cutting techniques.**

**Unit Competencies:**

1. Model and demonstrate appropriate flame cutting procedures.
2. Review, practice and demonstrate straight, bevel and shape oxyfuel cutting techniques.
3. Determine the effect of metal length and thickness on welding techniques.
4. Demonstrate maintenance techniques on oxyfuel equipment.

#### **Module 7: Plasma Arc Cutting (PAC)**

**Unit Objective: Students will describe how the effects of heat, metal thickness and metal length influence cutting techniques.**

**Unit Competencies:**

1. Demonstrate proper equipment set-up for plasma cutting.
2. Review, practice and demonstrate plasma cutting techniques.
3. Determine the effect of metal length and thickness on cutting techniques.
4. Demonstrate maintenance techniques on plasma cutting equipment.

## **Module 8: Gas Tungsten Arc Welding (GTAW)**

**Unit Objective: Students will demonstrate competency in gas tungsten arc welding.**

**Unit Competencies:**

1. Describe the principles and set-up.
2. Practice and demonstrate basic welding applications.
3. Demonstrate fillet and groove welds in all positions.
4. Demonstrate maintenance and minor repair techniques to equipment.

## **Module 9: Welding Inspection and Testing**

**Unit Objective: Students will be able to visually examine their work and that of others for discontinuities and defects.**

**Unit Competencies:**

1. Examine cut surfaces and edges of prepared base metal parts.
2. Examine tacks, root passes, intermediate layers and completed welds.

### **Certifications Offered:**

1. OSHA Safety Certification
2. AWS D1.1 Unlimited Structural
3. D9.1 18 gauge 3G,4G Sheet metal
4. AWS D1.1 GMAW 3G, 4G

### **Articulation Agreements:**

1. Local 100 Sheet Metal Union
2. Local 5 Plumber's Union
3. Local 5 Ironworker's Union