

## **Welding Technology**

### **AAS -Welding Technology**

#### **Competencies/Learning Outcomes**

##### **General Education Competencies:**

- I. Communicate Effectively
  1. Read and listen with comprehension.
  2. Speak and write clearly using standard English.
  3. Interact cooperatively with others using both verbal and non-verbal means.
  4. Demonstrate information processing through basic computer skills.
- II. Think Critically
  1. Make connections in learning across the disciplines and draw logical conclusions.
  2. Demonstrate problem solving through interpreting, analyzing, summarizing, and/or integrating a variety of materials.
  3. Use mathematics to organize, analyze, and synthesize data to solve a problem.
- III. Learn Independently
  1. Use appropriate search strategies and resources to find, evaluate, and use information.
  2. Make choices based upon awareness of ethics and differing perspectives/ideas.
  3. Apply learning in academic, personal, and public situations.
  4. Think creatively to develop new ideas, processes, or products.
- IV. Examine Relationships in Diverse and Complex Environments
  1. Recognize the relationship of the individual to human heritage and culture.
  2. Demonstrate an awareness of the relationship of the individual to the biological and physical environment.
  3. Develop an awareness of self as an individual member of a multicultural global community.

##### **Technical Competencies/Learning Outcomes:**

1. Identify, inspect, and maintain Gas Tungsten Arc Welding (GTAW) machines; identify, select, and store GTAW electrodes and filler rods.
2. Explain the principles of GTAW and the effects of variables on the GTAW process.
3. Explain the theory and application of Plasma Arc Cutting.
4. Demonstrate the necessary manipulative skills needed to apply the Gas Tungsten Arc on various joint designs, on plate with both ferrous and non-ferrous metals.
5. Identify, inspect, and maintain Gas Metal Arc Welding (GMAW) machines; identify, select, and store GMAW electrodes.
6. Explain principles of GMAW and the effects of variables on the GMAW process.
7. Explain the theory and applications of GMAW and related processes such as Flux Core Arc Welding (FCAW) and Submerged Arc Welding (SAW) and metallurgy.
8. Demonstrate the manipulative skills of Gas Metal Arc Welding on ferrous and non-ferrous metal and on joint designs on plate in all positions, including the welding of groove welds.
9. Explain and read occupationally-specific prints for welders and fabricate from a blueprint.
10. Explain the certification process in welding.
11. Test to certification standards on all types of welding.
12. Demonstrate a working knowledge of materials used in welding.
13. Demonstrate a working knowledge of oxy-fuel identification, set-up, inspection, and maintenance; including identification, selection and care, principles of operation, and effects of variables for manual and mechanized oxy-fuel cutting, welding, and brazing.
14. Identify, inspect, and maintain Shielded Metal Arc Welding (SMAW) electrodes.
15. Explain the principles of SMAW and the effects of variable on the SMAW process to weld plate and pipe.
16. Demonstrate the manipulative skills to perform fillet welds in all positions.
17. Demonstrate the manipulative skills to perform groove welds in all positions.
18. Practice safety procedures for all types of welding.