

# Plasma, Oxyfuel, Alloy and Hardfacing

## Course Description

Designed to instruct welders in welding safety, plasma cutting and gouging, the oxyfuel process, alloy theory and applications, and hardfacing. Additionally, various welding processes and techniques will be discussed as it relates to these topics. The course lasts 3 weeks, involving approximately 90 hours of booth instruction, lecture and practice.

## Course Content

### Week 1

- Learn fundamentals of oxy-fuel brazing (OFB) and oxyfuel welding (OFW). Discuss the use of welding vs. brazing vs. soldering.
- Learn general theory and use of preheating along with hands-on experience utilizing Tempil™ sticks.
- Learn the AWS numbering system, selection of proper brazing rods and fluxes, and troubleshooting of the oxyfuel process.
- In addition to a comparison between carbon arc gouging vs. plasma arc gouging, discuss the operation of plasma cutting along with standard troubleshooting and operational techniques

*30 Clock Hours: Lab - 25, Class - 5*

### Week 2

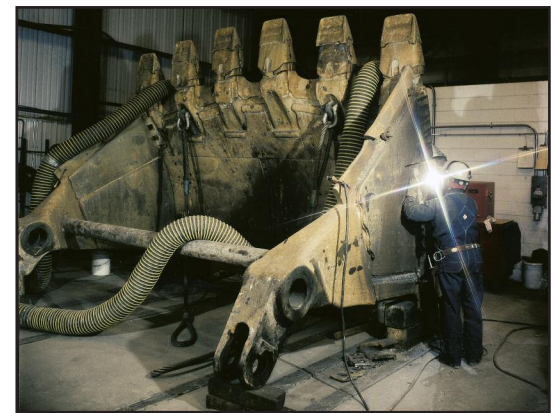
- Learn fundamentals of metal identification including the AISI & ASTM designations as well as steel trade names.
- Discuss low carbon, medium carbon, high carbon and alloy steel chemistry according to AWS D1.1 welding code.
- Determine preheat and discuss carbon equivalent, heat input (Joules) and heat-treating including tempering, annealing, normalizing and stress relieving.
- Learn fundamentals of hardfacing and 6 basic types of wear while using different welding processes: SMAW, FCAW, SAW and OFW.

*30 Clock Hours: Lab - 25, Class - 5*

### Week 3

- Learn fundamentals of cast iron including types of cast iron and repair procedures utilizing nickel and steel based electrodes as well as oxyfuel brazing (OFB) for cast iron repair.
- Learn fundamentals of stainless steel including the AISI numbering system, AWS classification system of electrodes, and carbide control.
- Use -15, -16, and -17 stainless stick electrodes to perform welds on stainless steel in all positions.

*30 Clock Hours: Lab - 25, Class - 5*



**Course Fee:**  
**\$1,000.00**

### 2010 Course Dates:

**Jan 25 - Feb 12**  
**Mar 29 - Apr 16**  
**May 10 - 28**  
**June 21 - July 9**  
**Aug 2 - Aug 20**  
**Sept 13 - Oct 1**  
**Oct 25 - Nov 12**