# WELD A212: GAS METAL ARC WELDING TRAINING LEVEL 2

| Item | Value |
|---|---|
| Curriculum Committee Approval Date | 11/13/2013 |
| Top Code | 095650 - Welding Technology |
| Units | 1 Total Units |
| Hours | 36 Total Hours (Lecture Hours 9; Lab Hours 27) |
| Total Outside of Class Hours | 0 |
| Course Credit Status | Credit: Degree Applicable (D) |
| Material Fee | Yes |
| Basic Skills | Not Basic Skills (N) |
| Repeatable | No |
| Grading Policy | Standard Letter (S),<br>• Pass/No Pass (B) |

## Course Description

This second level course teaches Gas Metal Arc Welding Theory and practice on ferrous and non-ferrous metals covering welding standards set by the American Welding Society, American National Standards Institute and I-CAR in preparation for qualification and certification requirements. PREREQUISITE: WELD A100, or WELD A101, or WELD A140. ADVISORY: WELD A211. Transfer Credit: CSU.

## Course Level Student Learning Outcome(s)

1. Demonstrate proper safety procedures.
2. Correctly adjust the welding machine for material and thickness.
3. Weld in flat, horizontal, vertical and overhead positions.

## Course Objectives

- 1. Demonstrate proper safety procedures.
- 2. Demonstrate expertise in GMAW theory.
- 3. Demonstrate an understanding of GMAW welding materials and filler requirements.
- 4. Correctly adjust GMAW welding equipment.
- 5. Demonstrate the relationship between amperage and voltage in GMAW welding.
- 6. Demonstrate correct preparation of materials prior to welding.
- 7. Weld in the flat, horizontal, vertical and overhead positions.
- 8. Discuss the criteria for acceptability of weldments to the ANSI/I-CAR.
- 9. Evaluate weld quality.
- 10. Discuss joint geometry and fit-up prior to welding.

## Lecture Content

Safety Personal safety Eye protection Ventilation Electric shock Care of equipment Welding Gasses Carbon dioxide Argon Blended gases Flow rates Regulator Flow Meters Adjustments Weld Preparation Material cleaning Contamination Porosity Fit-up Welding Variables Voltage Amperes/wire speed Wire composition Wire diameters Wire stick-out Wire spools Travel speed Joint Geometry Butt joints Lap joints Tee joints Corner joints Edge/flange joints Welding Positions Flat Horizontal Vertical Overhead Pipe in fixed positions Weld Testing A. Weld test qualifications and procedures B. Weld testing to I-CAR, ANSI and AWS standards.

## Lab Content

Safety Personal safety Eye protection Ventilation Electric shock Care of equipment Welding Gasses Carbon dioxide Argon Blended gases Flow rates Regulator Flow Meters Adjustments Weld Preparation Material cleaning Contamination Porosity Fit-up Welding Variables Voltage Amperes/wire speed Wire composition Wire diameters Wire stick-out Wire spools Travel speed Joint Geometry Butt joints Lap joints Tee joints Corner joints Edge/flange joints Welding Positions Flat Horizontal Vertical Overhead Pipe in fixed positions Weld Testing A. Weld test qualifications and procedures B. Weld testing to I-CAR, ANSI and AWS standards.

## Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

## Instructional Techniques

Competency-based skills evaluation and written examinations.

## Reading Assignments

Assigned reading from text, Handouts and safety examination materials.

## Writing Assignments

Written exams

## Out-of-class Assignments

Preparation for exams, assignments from textbook and other materials. Study of terminology and meaning.

## Demonstration of Critical Thinking

Written examinations and skills demonstration.

## Required Writing, Problem Solving, Skills Demonstration

Written examinations and skills demonstration.

## Textbooks Resources

1. Required Galvery, William and Frank Marlow. Welding Essentials: Questions and Answers , Latest ed. New York: Industrial Press, 2007 Rationale: . 2. Required Gas Metal Arc Welding Basic. Hobart Institute of Welding Technology, Latest ed. Hobart, 2012 3. Required Hobart Institute of Welding Technology. Gas Metal Arc Welding Basic EW 369 GMAWB, Latest ed. Hobart, 1997 Rationale: Industry standard textbook

## Other Resources

1. Selected handout materials to be provided and distributed by instructor. Orange Coast College Safety Examination