

University of Arkansas - Fort Smith
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General Syllabus

WELD 14044 MIG Welding – Basic

Credit Hours: 4

Lecture Hours: 2

Laboratory Hours: 4

Prerequisite or corequisite: WELD 12344 Introduction to Welding and Print Reading

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

In-depth study and practice of the gas metal arc welding process. The students will learn the principles of constant voltage power source and the mechanics and maintenance of various wire feeding systems. Practical assignments will include short circuit transfer on mild steel fillet welds in all positions; flux-cored arc welding of fillet welds in all positions; and AWS required workmanship samples.

B. Additional Information

This course prepares students for advanced gas metal arc welding (WELD 22854) and certification testing.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Understand and demonstrate the electrical characteristics of the constant potential power source utilized in the G.M.A.W. welding process.
2. Define the effects of voltage, wire feed speed, inductance, slope and electrical stick out as they pertain to the G.M.A.W. process and final weld quality.
3. Correctly set up the MIG welding power source and peripheral equipment adjusted to establish a good welding condition.
4. Identify, produce and properly fit the five basic weld joints as described by the American Welding Society.
5. Select the correct electrode for a specific base metal in accordance with the American Welding Society's Electrode Classification System.
6. Select the correct shielding gas and adjust gas flow rate according to the factory recommendations for a given welding condition.

7. Select and adjust equipment to produce a short circuit arc welding condition meeting American Welding Society's Visual Inspection Standards.
8. Select and adjust equipment according to factory specification to produce flux cored fillet welds in mild steel to American Welding Society's Visual Inspection Standards.
9. Identify weld defects and determine acceptability according to American Welding Society's Visual Inspection Standards.
10. Interpret weld symbols to produce various weld joint designs and final weldments in accordance with American Welding Society's Standards.
11. Replace and repair common maintenance items related to the MIG power source and peripheral equipment.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills: Students must analyze situations and make decisions in materials and techniques and make judgments in accordance with American Welding Society standards.

Quantitative Reasoning: Students must make precision measurements and figure acceptable tolerances within American Welding Society guidelines.

Ethical Decision Making

Students will evaluate work to meet American Welding Society standards and guidelines as well as evaluate how stakeholders are affected by the quality and safety of the finished welds.

III. Major Course Topics

- A. Theory, including safety and health practices; set-up; electrical characteristics; shielding gases; filler wires; metal transfers; voltage adjustments; wire feed speed adjustments, slope adjustments; inductance settings; electrical stick out; work and travel angles.
- B. Short circuit transfer on mild steel, including multi-directional surfacing welds; multi-pass fillet welds in all positions; multi-pass fillet welds on pipe to plate joints in all positions; pipe to plate pressure test; 1-G position groove welds on 3/8" plate; 2-G position groove welds on 3/8" plate; bend test.
- C. Flux cored arc welding – gas shielded wires including fillet welds in all positions.
- D. Fabrication, Workmanship Sample #AWS-1, Figure 2.