

Introduction to Shielded Metal Arc Welding (WLDG 1428)



Credit: 4 semester credit hours (2 hours lecture, 8 Hour Lab)

Prerequisite/Co-requisite: None

Course Description

An introduction to shielded metal arc welding process. Emphasis placed on power sources, electrode selection, oxy-fuel cutting, and various joint designs. Instruction provided in SMAW fillet welds in various positions.

Required Textbook and Materials

1. *Modern Welding*. Althouse, Turnquist, Bowditch. 2013
 - a. ISBN number is 978-1-60525-795-2
2. **Personal Tool List** (approximately \$150-\$250).
 1. Hood
 2. Welders cap
 3. Shade 10 or 11 lens
 4. Clear lens (10)
 5. Long sleeve 100% cotton shirt or leather sleeves or leather jacket
 6. Long 100% cotton work pants (jeans)
 7. High top leather boots (steel toe)
 8. Leather gloves
 9. Chipping hammer
 10. Wire brush
 11. Safety glasses
 12. Cutting goggles or glasses (shade 5)
 13. Measuring tape
 14. Tip cleaner
 15. 12" combination square
 16. Pliers
 17. Flashlight
 18. 4 1/2" or 5" grinder

Students will not be allowed in class without the proper equipment and clothing

Course Objectives

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

1. Select electrodes and amperage setting for various thicknesses of metal and welding positions.
2. Define principles of arc welding; and explain electrode classification.
3. Perform SMAW operations in various positions using selected electrodes and different joint designs.

Approved 12/2013

Course Outline

- I. **The cutting station**
 - A. Oxyacetylene start-up procedures
 - B. Oxyacetylene shut-down procedures
 - C. Care of the oxyacetylene equipment
 - D. Set-up and shut-down of oxyacetylene torch
- II. **Oxyacetylene cutting**
 - A. Cutting tip selection
 - B. Discuss different cutting techniques
 - C. Perform proper oxyacetylene cuts
 - D. Discuss personal factors that affect safety on the job
- III. **General safety**
 - A. General shop safety
 - B. Maintenance and troubleshooting of equipment.
- IV. **Specific safety**
 - A. Proper personal protective equipment
 - B. Oxyacetylene cutting safety procedures
 - C. Welding safety procedures
 - D. Grinder safety procedures
- V. **Power tools**
 - A. Portable grinders
 - B. Band saw
 - C. Bend testing machine
- VI. **Electrodes**
 - A. AWS numbering system of electrodes
 - B. Electrode selection for various thicknesses of metal
- VII. **The welding machine**
 - A. Different types of welding machines
 - B. Polarity(dc+, dc- or ac)
- VIII. **SMAW-arc welding**
 - A. Amperage setting for types of electrodes
 - B. Welding techniques
 - C. Fillet welds in all position

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

Assignments	30%
TEST	70%

Late Penalties will be assessed on all work turned in late. 5 points per day.

Average a grade on all test and assignments of at least 70%.

Course Requirements

1. Perform SMAW fillet welds in 2F position using 7018 and 6010 electrodes.
2. Perform SMAW fillet welds in 3F position using 7018 and 6010 electrodes.
3. Perform SMAW fillet welds in 4F position using 7018 and 6010 electrodes.
4. Perform proper set-up and shut-down of oxyacetylene torch.
5. Perform proper oxyacetylene cuts.
6. Use proper personal protective equipment

Attendance Policy

- I. Students are allowed to miss two days without penalty; each additional day will result in the student's grade being dropped by a letter grade.

Example: 2 days absent = If student has an A average no penalty
 3 days absent = A drops to a B
 4 days absent = B drops to a C
 5 days absent = C drops to a D (student must retake class)
 6 days absent = D drops to a F (student must retake class)

- II. Absences are counted for unexcused, excused and coming to class late.

- III. 3 tardies = 1 absence

A. Tardy- arriving within 15 minutes after class begins or leaving before the end of class.

B. More than 15 minutes late you will be counted absent.

C. If you go to sleep in class you will be counted absent.

- IV. **Excused absences.** Only given to allow students to make up missed work.

A. Will be given for documented Injury or Illness. Doctor's excuse required showing proof. Will count toward total days missed.

B. Will be given for documented Death in immediate family. Will count toward total days missed.

C. Approved LIT school functions; E.g. SkillsUSA, SGA etc. Will not count toward total days missed

D. It is the student's responsibility to obtain from the instructor any handouts or assignments for classes missed. Lectures will not be repeated.

- V. If you wish to drop, you are responsible for the drop process. I will not initiate the drop, no matter how many absences or zeroes you have; that is, if you stop coming to class and do not drop, you will earn an "F" in the course. Students are only allowed to drop 6 times in their college career.

Classroom Policies

1. No electronic devices of any kind (cell phones, I-pod, headphone, ect.) will be tolerated in the classrooms or labs. If you are seen using any electronic device you will be asked to leave the class for the day.
2. No food or drink will be allowed in the classroom.
3. No derogatory or foul language will be tolerated.
4. We have a zero tolerance policy for sexual harassment.
5. We have a zero tolerance policy of racial or ethnic discrimination.
6. Be considerate of others in the classroom. Remember they paid for the class just like you.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic	Reference
1/3	Course introduction and policies Shop orientation and safety procedures Cutting torch safety and procedures Measuring and Lay-out tools Use the Oxyfuel torch to cut metal Striking an Arc Running a Bead Welding a Pad Visual test of weld beads • LECTURE/LAB	Syllabi Instructor Demonstration/ Supervision
4-8	Use the Oxyfuel torch to cut metal Welding Horizontal Fillet Welds with 6010 and 7018 Electrodes Visual test of weld beads • LECTURE/LAB	Instructor Demonstration/ Supervision
9-12	Use the Oxyfuel torch to cut metal Welding Vertical Fillet Welds with 6010 and 7018 Electrodes Visual test of weld beads • LECTURE/LAB	Instructor Demonstration/ Supervision
13-16	Use the Oxyfuel torch to cut metal	Instructor

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Course Syllabus

Week	Topic	Reference
	Welding Overhead Fillet Welds with 6010 and 7018 Electrodes	Demonstration/ Supervision
	Visual test of weld beads	
	• LECTURE/LAB	