

Advanced Gas Metal Arc Welding (WLDG 2447)



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

Prerequisite/Co-requisite: WLDG 2413

Course Description

Advanced topics in Gas Metal Arc Welding (GMAW). Includes welding in various positions.

Required Textbook and Materials

1. *Modern Welding* by 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

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. Demonstrate proficiency with GMAW in various welding positions on pipe.
2. Describe safety rule and equipment used in GMAW.
3. Describe the effects of welding parameters in GMAW.
4. Weld various joint designs and diagnose welding problems and perform visual inspections.

Course Outline

Approved 12/2013

1. **Define safety procedures when using GMAW equipment**
 - i. Discuss and perform safety procedures when setting up the GMAW welding station
 - ii. Discuss and perform safety procedures for handling high pressure shielding gas cylinders
 - iii. Discuss and practice proper personal protective equipment while using GAMW
2. **Define welding parameters of GMAW**
 - i. Discuss and set wire speed on GMAW machine
 - ii. Discuss and set voltage on GMAW machine
 - iii. Discuss and select the proper shielding gas
 - iv. Discuss how the weld position affects the welding parameters of GMAW
3. **Demonstrate proficiency in GMAW welding in various positions**
 - i. GMAW carbon steel pipe in 1G position
 - ii. GMAW carbon steel pipe in 2G position
 - iii. GMAW carbon steel pipe in 5G position
 - iv. GMAW carbon steel pipe in 6G position
4. **Test and diagnose various joint designs and welds**
 - i. Discuss and perform visual test of welds
 - ii. Discuss and perform both nondestructive and destructive test
 - iii. Discuss and identify flaws and defects in weld
 - iv. Discuss proper joint design

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. Attend class regularly.
2. Demonstrate proficiency with the pipe beveling machine and track torch
3. Demonstrate proficiency with GMAW in various welding positions on pipe.
4. Weld various joint designs and diagnose welding problems and perform visual inspections.

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.

Course Policies

1. No electronic devices of any kind (cell phones, I-pod, headphone, etc.) 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.

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 online resource:

<http://www.lit.edu/depts/stuserv/special/defaults.aspx>

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office.

Course Schedule

Week	Topic	Reference
1-2	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 Set up GMAW/FCAW station Weld Fillet weld in various position and test • LECTURE/LAB	Syllabi Instructor Demonstration/ Supervision
3-6	Use track torch to cut beveled plates GMAW/FCAW weld Vee Groove welds in all positions and test • LECTURE/LAB	Instructor Demonstration/ Supervision
7-8	Use pipe beveling machine to bevel pipe GMAW/FCAW weld pipe in 1G (roll out) position and test • LECTURE/LAB	Instructor Demonstration/ Supervision
9-10	Use pipe beveling machine to bevel pipe GMAW/FCAW weld pipe in 2G position • LECTURE/LAB	Instructor Demonstration/ Supervision
11-13	Use pipe beveling machine to bevel pipe GMAW/FCAW weld pipe in 5G position	Instructor Demonstration/

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Course Syllabus

Week	Topic	Reference
	<ul style="list-style-type: none">• LECTURE/LAB	Supervision
14-16	Use pipe beveling machine to bevel pipe GMAW/FCAW weld pipe in 6G position <ul style="list-style-type: none">• LECTURE/LAB	Instructor Demonstration/ Supervision