

## Advanced Pipe Welding (WLDG 2453)



**Credit:** 4 semester credit hours (2 hours lecture, 8 hours lab)

**Prerequisite/Co-requisite:** WLDG 2406

### Course Description

Advanced topics involving welding of pipe using the shielded metal arc welding (SMAW) process. Topics include electrode selection, equipment setup, and safe shop practices. Emphasis on weld positions 5G and 6G using various electrodes.

### Required Textbook and Materials

1. *Modern Welding*. Althouse, Turnquist, Bowditch. 2013
  - a. ISBN number is 978-1-60525-795-2
2. Tool List (approximately \$150).
  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. Describe equipment and pipe preparation.
2. Perform 5G and 6G welds using various electrodes.
3. Perform 5G and 6G on various sizes pipe.

### Course Outline:

Approved 12/2013

**1. Oxy-fuel cutting**

- Perform proper safety procedures
- Manually square cut pipe to desire length using oxy-fuel torch
- Manually bevel pipe to desired length using oxy-fuel torch
- Perform oxy-fuel square cuts and beveled cuts on pipe using an automatic watts cutting machine
- Perform square and beveled plasma arc cuts and beveled cuts using the watts automatic cutting machine

**2. SMAW electrodes and GTAW filler metal**

- Safety hazards of electrodes
- Types and sizes of electrodes
- Electrodes for various size pipe and positions

**3. Equipment**

- Welding machine and equipment and perform daily checks
- Setup and adjustment of the SMAW welding station
- Polarity of the SMAW machine welding procedure
- Power source

**4. SMAW and GTAW pipe welding**

- perform single Vee groove pipe weld in the 1G position
- perform single Vee groove pipe weld in the 2G position
- perform single Vee groove pipe weld in the 5G position
- perform single Vee groove pipe weld in the 6G position

**5. Inspection and testing**

- Nondestructive test to detect flaws and defect
- Destructive test to AWS standards

**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%
Tests	70%

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

**Course Requirements**

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1. Complete WorkKeys tests.
2. Successfully complete an AMSE Welding Certification for a 6G pipe weld.
3. Bevel pipe to length using beveling machine.
4. Perform 1G, 2G, 5G and 6G welds using various electrodes.
5. Perform 5G and 6G on various sizes pipe.

**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**

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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](http://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 Measuring and Lay-out tools Use the Oxyfuel torch to cut pipe to length Use of pipe beveling machine 1G (roll out) pipe welds Visual test • LECTURE/LAB	Syllabi  Instructor Demonstration/ Supervision
3-6	Use of pipe beveling machine 2G pipe welds Visual test	Instructor Demonstration/ Supervision

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<b>Week</b>	<b>Topic</b>	<b>Reference</b>
	<ul style="list-style-type: none"><li>• LECTURE/LAB</li></ul>	
7-12	Use of pipe beveling machine 5G pipe welds Visual Test <ul style="list-style-type: none"><li>• LECTURE/LAB</li></ul>	Instructor Demonstration/ Supervision
13-16	Use of pipe beveling machine 6G pipe welds Test to ASME pipe certification test <ul style="list-style-type: none"><li>• LECTURE/LAB</li></ul>	Instructor Demonstration/ Supervision