

## Introduction to Gas Tungsten Arc Welding (WLDG 1434)



**Credit:** 4 semester credit hours (4 hours lecture)

**Prerequisite/Co-requisite:** None

### Course Description

Principles of gas tungsten arc welding (GTAW), including setup, GTAW equipment. Instruction in various positions and joint designs

### 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

### Course Objectives

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

1. Describe various joint designs.
2. Describe safety rules and equipment.
3. Describe the effect of welding parameters in GTAW, GMAW and FCAW.
4. Perform weld using GTAW, GMAW, and FCAW on various structural materials.

### Course Outline

- I. **Proper setup of GTAW equipment**
  - A. Components of GTAW
  - B. GTAW for safe operation

Approved 12/2013

**WLDG 1434**  
Course Syllabi

- C. gas cylinder
- II. **Effects of welding parameters used in GTAW, GMAW and FCAW**
  - A. Welding parameters used for welding various metals
  - B. Positions and joint design affect welding parameters
  - C. Advantages and disadvantages of GTAW, GMAW, and FCAW
- III. **Welds in various positions on a variety of joint designs using GTAW**
  - A. Joint designs
  - B. Positions used in GTAW
  - C. Weld coupons in various positions and joint designs
  - D. Visual inspections for flaws and defects
- IV. **Welds in various positions on a variety of joint designs using GMAW**
  - A. Welds in the various modes of GMAW
  - B. Positions used in GMAW
  - C. Weld coupons in various positions and joint designs
  - D. Visual inspections for flaws and defects
- V. **Welds in various positions on a variety of joint designs using FCAW**
  - A. Various joint designs
  - B. Different positions used in FCAW
  - C. Weld coupons in various positions and joint designs
  - D. Visual inspections for flaws and defects

**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% |

1. Late Penalties will be assessed on all work turned in late. 5 points per day.
2. Average a grade on all test and assignments of at least 70%.

**Course Requirements**

1. Proper use of Oxyfuel hand torch.
2. Proper use of the Oxyfuel track torch.
3. Identify various joint designs.
4. Follow safety rules and equipment.
5. Know the effect of welding parameters in GTAW, GMAW and FCAW.

### **Attendance Policy**

- I. Students are allowed to miss two days without penalty, each additional day will result in the students 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 tardys = 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, 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. The program has a zero tolerance policy for sexual harassment.
5. The program has 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**

| <b>Week</b> | <b>Topic</b>   | <b>Reference</b>                            |
|-------------|--|---|
| 1-3         | Course introduction and policies<br>GTAW, GMAW, and FCAW Equipment and Supplies<br>Test 1<br>• LECTURE   | Syllabi<br>Chapter 7                        |
| 4-5         | Gas Tungsten Arc Welding<br>Test 2<br>• LECTURE  | Chapter 8                                   |
| 6-10        | Use of Oxyfuel cutting torch<br>Use track torch to cut beveled plates<br>Weld Fillet weld in various positions using GTAW<br>Weld Vee Groove welds in various positions using GTAW<br>Skill evaluation<br>• LECTURE/LAB                | Instructor<br>Demonstration/<br>Supervision |
| 10-11       | Gas Metal and Flux Cored Arc Welding<br>Test 3<br>• LECTURE  | Chapter 9                                   |
| 12-16       | Use of Oxyfuel cutting torch<br>Use track torch to cut beveled plates<br>Weld Fillet weld in various positions using GMAW and CAW<br>Weld Vee Groove welds in various positions using GMAW & FCAW<br>Skill evaluation<br>• LECTURE/LAB | Instructor<br>Demonstration/<br>Supervision |