

## **Intermediate Welding using Multiple Processes (WLDG 2413)**



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

**Prerequisite/Co-requisite:** WLDG 2443

### **Course Description**

Instruction using layout and blueprint reading with demonstration and guided practice with some of the following welding processes: oxy-fuel gas cutting and welding, shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux-cored arc welding (FCAW), gas tungsten arc welding (GTAW), or any other approved welding process.

### **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. Identify proper safety equipment and tools. Identify and select the proper welding process for a given application.
2. Demonstrate skills training using more than one approved welding process. Demonstrate ability to analyze situations and make decisions using skills as taught concerning safety and electrode selection.
3. Select the most economical and practical welding process for a given task.

Approved 12/2013

## Course Outline

1. **Cutting Station**
  - Use of cutting torch.
  - Use of track torch.
  - Use of pipe beveling machine.
2. **Selection of electrodes**
  - SMAW electrodes.
  - GTAW electrodes.
3. **Power sources**
  - Constant current.
  - Constant Voltage.
4. **Proper setup and use of GTAW equipment**
  - Components of GTAW.
  - Setting up GTAW
  - GTAW fillet welds in various positions.
  - GTAW groove welds in various positions.
5. **Proper setup and use of GMAW equipment**
  - Components of GMAW.
  - Procedures for setting up GMAW
  - GMAW fillet welds in various positions.
  - GMAW groove welds in various positions.
6. **Proper setup and use of FCAW equipment**
  - Components of FCAW.
  - Procedures for setting up FCAW
  - FCAW fillet welds in various positions.
  - FCAW groove welds in various position
7. **Proper setup and use of SMAW equipment**
  - Components of SMAW.
  - Procedures for setting up SMAW
  - SMAW fillet welds in various positions.
  - SMAW groove welds in various positions.

## 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%

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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. Demonstrate skills training using more than one approved welding process.
2. Demonstrate ability to analyze situations and make decisions using skills as taught concerning safety and electrode selection.
3. Perform GTAW fillet welds in various positions.
4. Perform GTAW groove welds in various positions.
5. Perform GMAW fillet welds in various positions.
6. Perform GMAW groove welds in various positions.
7. Perform FCAW fillet welds in various positions.
8. Perform FCAW groove welds in various positions.
9. Perform SMAW fillet welds in various positions.
10. Perform SMAW groove welds in various positions.

### **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 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.

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- 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, 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.

### **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>
1-4	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 Use track torch to cut beveled plate Set up GTAW station GTAW Fillet weld in various position Test GTAW (Fillet and Groove welds) • LECTURE/LAB	Syllabi  Instructor Demonstration/ Supervision
5-8	Use the Oxyfuel torch to cut metal Use track torch to cut beveled plates GMAW Fillet weld in various position GMAW Groove weld in various position Test GMAW (Fillet and Groove welds) • LECTURE/LAB	Instructor Demonstration/ Supervision
9-12	Use the Oxyfuel torch to cut metal Use track torch to cut beveled plates FCAW Fillet weld in various position FCAW Groove weld in various position Test FCAW (Fillet and Groove welds) • LECTURE/LAB	Instructor Demonstration/ Supervision
13-16	Use the Oxyfuel torch to cut metal Use track torch to cut beveled plates SMAW Fillet weld in various position SMAW Groove weld in various position Test SMAW (Fillet and Groove welds) • LECTURE/LAB	Instructor Demonstration/ Supervision