Introduction to Welding using Multiple Processes (WLDG 1407)

Credit: 4 semester credit hours (2 hours lecture, 6 hour lab)

Prerequisite/Co-requisite: None

Course Description

This course is basic welding processes, includes Oxy-fuel welding (OFW) and cutting, Shielding Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and Gas Tungsten Arc Welding (GTAW).

Required Textbook and Materials

1. *Modern Welding* by Althouse, Turnquist, Bowditch 12th Edition
    a. Latest Edition
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.

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	20%
Lab Exercises	25%
Test	25%
Final	30%

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

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.

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignments will be accepted.
5. Tests. Students that miss a test are not allowed to make up the test. Students that miss a test will receive a grade of '0'.
6. Attendance Policy. Two absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Each absence beyond two absences will result in a 5% deduction from your final grade.
7. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
8. Additional class policies as defined by the individual course instructor.

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.

Starfish

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT

Course Schedule (Subject to Change)

Week	Topic	Reference
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