Advanced Flux Cored Arc Welding (WLDG-2452)

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

Prerequisite/Co-requisite: WLDG 2413

Course Description

Advanced Concepts of Flux cored arc welding of structural and fabricated steel products. Skill development in multi-pass fillet and groove welding.

Required Textbook and Materials

1. *Modern Welding.* Althouse, Turnquist, Bowditch. 2004
    a. ISBN number is 1-56637-987-3
2. Personal Tool List (approximately $150-$250).
    a. Hood
    b. Welders Cap
    c. Shade 9 Or 10 Lens
    d. Clear Lens (10)
    e. Long Sleeve 100% Cotton Shirt Or Leather Sleves Or Jacket
    f. Long 100% Cotton Work Pants
    g. High Top Leather Boots –Steel Toe
    h. Leather Gloves
    i. Chiping Hammer
    j. Wire Brush
    k. Safety Glasses
    l. Cutting Goggles Or Glasses
    m. Measuring Tape
    n. Tip Cleaner
    o. 12” Square
    p. 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. (SCANS C5.4, C6.4, C7.4, C9.3, C10.3, C14.4, C18.3, C19.3, F1.5, F2.3, F3.4, F5.5, F6.4, F9.3, F12.3, F13.5, F14.3, F15.3,F16.3, F17.5)
2. Describe safety rule and equipment used in GMAW. (SCANS C5.4, C6.4, C7.4, C9.3, C10.3, C14.4, C18.3, C19.3, F1.5, F2.3, F3.4, F5.5, F6.4, F9.3, F12.3, F13.5, F14.3, F15.3,F16.3, F17.5)
3. Describe the effects of welding parameters in GMAW. (SCANS C5.4, C6.4, C7.4, C9.3, C10.3, C14.4, C18.3, C19.3, F1.5, F2.3, F3.4, F5.5, F6.4, F9.3, F12.3, F13.5, F14.3, F15.3,F16.3, F17.5)

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4. Weld various joint designs and diagnose welding problems and perform visual inspections. (SCANS C1.4, C3.2, C5.4, C6.4, C7.4, C9.3, C10.3, C11.2, C14.4, C18.3, C19.3, C20.4, F1.5, F2.3, F3.4, F5.5, F6.4,F7.3, F8.3, F9.4, F11.4,F12.4, F13.5, F14.3, F15.3,F16.3, F17.5)

SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor **S**ecretary's **C**ommission on **A**chieving **N**ecessary **S**kills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools.* In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies.

Course Outline

1. Define safety procedures when using FCAW equipment
    - Discuss and perform safety procedures when setting up the FCAW welding station
    - Discuss and perform safety procedures for handling high pressure shielding gas cylinders
    - Discuss and practice proper personal protective equipment while using FCAW

2. Define welding parameters of FCAW
    - Discuss and set wire speed on FCAW machine
    - Discuss and set voltage on FCAW machine
    - Discuss and select the proper shielding gas
    - Discuss how the weld position affects the welding parameters of FCAW

3. Demonstrate proficiency in FCAW welding in various positions
    - FCAW carbon steel pipe in 1G position
    - FCAW carbon steel pipe in 2G position
    - FCAW carbon steel pipe in 5G position
    - FCAW carbon steel pipe in 6G position

4. Test and diagnose various joint designs and welds
    - Discuss and perform visual test of welds
    - Discuss and perform both nondestructive and destructive test
    - Discuss and identify flaws and defects in weld
    - 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:

Activity	***Percentage***
Assignments	30%
TEST	70%
Total	***100%***

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

Course Requirements

1. Demonstrate proficiency with the pipe beveling machine and track torch
2. Demonstrate proficiency with FCAW in various welding positions on pipe.
3. Describe safety rule and equipment used in FCAW.
4. Describe the effects of welding parameters in FCAW.
5. 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 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

- 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.
- No food or drink will be allowed in the classroom.
- No derogatory or foul language will be tolerated.
- We have a zero tolerance policy for sexual harassment.
- We have a zero tolerance policy of racial or ethnic discrimination.
- 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.

Course Schedule

Week	Topic	Reference
1-2	Course introduction and policies	Syllabi
	Shop orientation and safety procedures	
	Cutting torch safety and procedures	Instructor

Week	Topic	Reference
	Measuring and Lay-out tools Use the Oxyfuel torch to cut metal Set up GMAW station Weld Fillet weld in various position • LECTURE/LAB	Demonstration/ Supervision
3-6	Use track torch to cut beveled plates Weld Vee Groove welds in all positions • LECTURE/LAB	Instructor Demonstration/ Supervision
7-8	Use pipe beveling machine to bevel pipe Weld pipe in 1G (roll out) position • LECTURE/LAB	Instructor Demonstration/ Supervision
9-10	Use pipe beveling machine to bevel pipe Weld pipe in 2G (roll out) position • LECTURE/LAB	Instructor Demonstration/ Supervision
11-13	Use pipe beveling machine to bevel pipe Weld pipe in 5G (roll out) position • LECTURE/LAB	Instructor Demonstration/ Supervision
14-16	Use pipe beveling machine to bevel pipe Weld pipe in 6G (roll out) position • LECTURE/LAB	Instructor Demonstration/ Supervision