

Course Outline for WLDT 61AL
BEGINNING SMAW AND FCAW SKILLS LAB
Effective: Spring 2018

I. CATALOG DESCRIPTION:

WLDT 61AL — BEGINNING SMAW AND FCAW SKILLS LAB — 2.00 units

Skills of Shielded Metal Arc (SMAW) and Flux-Core Arc (FCAW) welding in the flat and horizontal positions to to American Welding Society code specifications. Oxy-fuel flame, plasma, and carbon arc cutting. Safe use and handling of welding equipment and consumables.

2.00 Units Lab

Corequisite

WLDT 61A - Beginning SMAW and FCAW Theory
 or

WLDT 61B - Advanced SMAW and FCAW Theory

Grading Methods:

Letter or P/NP

Discipline:

- Welding

	MIN
Lab Hours:	108.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 4

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

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

- A. Identify and demonstrate safe use of basic equipment associated with:
 - 1. Shielded Metal Arc (SMAW)
 - 2. Flux Core Arc (FCAW)
 - 3. Plasma cutting
 - 4. Oxy-fuel cutting
 - 5. Carbon arc cutting
- B. Illustrate the uses and limitations of each process
- C. Employ proper electrode and wire selection for application
- D. Recognize common metals
- E. Practice FCAW, SMAW welded plate steel in the flat and horizontal positions to AWS specifications
- F. Apply circumferential welds in flat and rolled position
- G. Specify the uses and limitations of Constant Current and Constant Voltage power sources
- H. Practice Plasma and oxy-fuel cutting manually
 - I. Employ Oxy-fuel cutting with a machine
- J. Identify and demonstrate safe practices in the welding shop
- K. Use simple blueprints to make parts
- L. Operate the following welding support equipment safely:
 - 1. Grinder
 - 2. Saw

V. CONTENT:

- A. Basic equipment associated with each welding/cutting process covered
- B. Uses and limitations of each process covered
- C. Electrode and wire selection for different applications
- D. Common metals
- E. FCAW, SMAW welded plate steel in the flat, horizontal and vertical positions to AWS specifications
- F. Circumferential welds in flat and rolled position
- G. Welding power supplies, AC and DC, constant current and constant voltage
- H. Plasma and oxy-fuel cutting

- I. Machine cutting
- J. Safe handling and use
 - 1. Shielded Metal Arc (SMAW)
 - 2. Flux Core Arc (FCAW)
 - 3. Oxy-fuel cutting
 - 4. Plasma cutting
 - 5. Carbon arc cutting
- K. Blueprint usage in the welding shop
- L. Welding support equipment safe use and application
 - 1. Grinder
 - 2. Saw

VI. METHODS OF INSTRUCTION:

- A. **Lecture** -
- B. **Discussion** -
- C. Correlation with real world industrial applications
- D. Visual aids
- E. One-on-one, hands-on instruction
- F. Group demonstration

VII. TYPICAL ASSIGNMENTS:

- A. Welding samples using different welding processes
 - 1. Shielded Metal Arc Welding (SMAW)
 - 2. Flux-core Arc Welding (FCAW)
- B. Welding samples using different welding joints
 - 1. Butt joint
 - 2. Tee joint
 - 3. Lap joint
 - 4. Corner joint
 - 5. Edge joint
- C. Welding samples using different positions
 - 1. Flat
 - 2. Horizontal
 - 3. Vertical
- D. Welding Samples using different materials
 - 1. Carbon Steel
 - 2. Stainless Steel
- E. Cutting samples using hand held oxy-acetylene cutting torch
- F. Cutting samples using semi-automated oxy-acetylene cutting torch
- G. Cutting samples using hand held plasma arc cutting torch

VIII. EVALUATION:

A. **Methods**

- 1. Exams/Tests
- 2. Projects
- 3. Class Participation
- 4. Class Work
- 5. Home Work
- 6. Lab Activities

B. **Frequency**

- 1. Exams once per semester
- 2. Projects on an as assigned basis
- 3. Participation will be evaluated daily
- 4. Work samples will be submitted for grading as completed over the duration of the semester
- 5. Homework as assigned
- 6. Lab safety and proper use of tools will be evaluated on a daily basis

IX. TYPICAL TEXTS:

- 1. Jeffus, Larry. *Welding Principles and Practices*. 7th ed., Delmar, 2012.
- 2. American Welding Society. *Standard Welding Terms and Definitions*. 2010 ed., American Welding Society, 2010.
- 3. American Welding Society. *Structural Welding Code - Steel*. 2015 ed., American Welding Society, 2015.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Safety Glasses (ANSI Z87.1)
- B. Personal Protective Equipment
- C. Leather welding gloves
- D. Long sleeve shirt or jacket
- E. Leather shoes or boots