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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