Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for WLDT 62A

BEGINNING TIG/MIG/BLUEPRINT

Effective: Fall 2008

I. CATALOG DESCRIPTION:
WLDT 62A — BEGINNING TIG/MIG/BLUEPRINT — 1.00 units

Theory of fuel and inert gas welding of steel and aluminum alloys, oxyacetylene brazing, flame cutting, and plasma cutting. TIG or Gas Tungsten Arc (GTAW) and MIG or Gas Metal Arc (GMAW) welding equipment and supplies. Nomenclature and metallurgy of steel and aluminum alloys. Introduction to blueprint reading. Hazardous material regulations and material safety data sheets.

1.00 Units Lecture

Corequisite
WLDT 61AL - Beginning SMAW and FCAW Skills Lab
or

WLDT 61BL - Advanced SMAW and FCAW Skills Lab

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	18.00
Total Hours:	18.00

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. Explain and apply the theory and safe use of Gas Tungsten Arc Welding (GTAW)
B. Explain and apply the theory and safe use of Gas Metal Arc Welding (GMAW)
C. Explain and apply the theory and safe use of Oxy-Fuel welding, brazing and cutting;
D. Explain and apply the theory and safe use of Plasma Arc Cutting;
E. Outline basic metallurgy and numbering systems for steels and aluminum;
F. Specify the AWS electrode numbering systems and uses for GTAW;
G. Specify the AWS electrode wire numbering systems and uses for GMAW;
H. Apply basic orthographic and isometric blueprint reading skills;
I. Use correctly Welding Society (AWS) welding symbols and nomenclature;
J. Identify material hazards in the welding trade;
K. Report on career opportunities in the welding trade.

V. CONTENT:
A. GTAW theory, safety and process basics
1. Technique
2. Power supplies, AC a dn DC, Constant Current
3. Equipment and supplies
4. Electrodes
5. Uses and limitations
6. Safety
7. Industrial applications
8. Industry trends
B. GMAW theory, safety and process basics
1. Technique
2. Power supplies, AC and DC, Constant Voltage
3. Equipment and supplies
4. Electrodes
5. Uses and limitations
6. Safety

7. Industrial applications
8. Industry trends

C. Oxy-Fuel cutting, welding, brazing theory, safety and process basics
1. Technique
2. Equipment and supplies
3. Filler metal
4. Uses and limitations
5. Safety
6. Industrial applications
7. Industry trends

D. Plasma arc cutting theory, safety and process basics
1. Technique
2. Power supplies
3. Equipment and supplies
4. Uses and limitations
5. Safety
6. Industrial applications
7. Industry trends

E. Carbon arc cutting theory, safety and process basics
1. Technique
2. Power supplies
3. Equipment and supplies
4. Electrodes
5. uses and limitations
6. Safety
7. Industrial applications
8. Industry trends

F. Understand basic metallurgy and numbering systems for steels and aluminum
1. Basic steel metallurgy
2. Basic aluminum metallurgy
3. Welding effects on metallurgy
4. Heat Affected Zone (HAZ)
5. AISI/SAE numbering system
6. Aluminum Association numbering system
7. ASTM numbering system
8. UNS numbering system

G. Demonstrate knowledge of AWS electrode identification systems and uses for GTAW
1. AWS identification system for tungsten electrodes
2. Uses of different electrode classes

H. Demonstrate knowledge of AWS electrode identification systems and uses for GTAW
1. WS numbering system for GMAW electrode wires

I. Apply basic orthographic and isometric blueprint reading skills
1. Blueprint uses and applications
2. Isometric drawings
3. Orthographic drawings
4. Assembly drawings
5. Detail drawings
6. Line types
7. Dimensions
8. Views
9. Sections
10. Notes
11. Title block
12. Bill of materials

J. Use and understand American Welding Society (AWS) welding symbols and nomenclature
1. AWS standard weld symbols
2. AWS nomenclature
3. uses and applications

K. Understand material hazards in the welding trade
1. Material hazards
2. Welding hazards
3. MSDS
4. OSHA
5. Other safety

L. Career opportunities in the welding trade
1. Typical work
2. Work environment
3. Basic skills
4. Apprenticeship
5. Wages
6. Advancement
7. Outlook

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. Correlation with real world industrial applications
C. Visual aids
D. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Weekly reading assignments from text B. Quizzes based on weekly reading assignments

VIII. EVALUATION:
A. **Methods**

1. Exams/Tests
2. Quizzes
3. Class Participation
4. Other:

a. Methods:
    1. Participation
    2. Quizzes
    3. Midterm and final

B. **Frequency**

1. Frequency:
    a. Participation will be evaluated daily.
    b. Quizzes will be administered periodically during the semester on an as needed basis.
    c. The midterm will be administered near the halfway point in the course followed by a two hour final exam during finals week.

IX. TYPICAL TEXTS:

1. Althouse, Turnquist, Bowditch, Bowditch, Bowditch *Modem Welding.*, Goodheart-Willcox Company, 2004.
2. Bennet, Siy *Blueprint Reading for Welders.*, Delmar, 1999.
3. The Lincoln Electric Co *The Procedure Handbook for ARC Welding.* 12th ed., The Lincoln Electric Co, 2003.

X. OTHER MATERIALS REQUIRED OF STUDENTS: