Las Positas College
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Course Outline for WLDT 63

WELDING LAYOUT AND FITTING

Effective: Fall 2008

I. CATALOG DESCRIPTION:
WLDT 63 — WELDING LAYOUT AND FITTING — 2.00 units

Interpretation of welding blueprints by making welding layouts and fitups. Current methods, practices, and recommended procedures. Use of jigs, fixtures, holding devices, and welding sequences. Methods of straightening and restoring dimensions to finished product. Laboratory includes Arc, MIG, TIG, and Flux-core welding, plasma and fuel cutting.

1.00 Units Lecture 1.00 Units Lab

Prerequisite
WLDT 62BL - Advanced GTAW and GMAW Skills Lab
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	18.00
Lab Hours:	54.00
Total Hours:	72.00

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

III. PREREQUISITE AND/OR ADVISORY SKILLS:
Before entering the course a student should be able to:

A. WLDT62BL

IV. MEASURABLE OBJECTIVES:
Upon completion of this course, the student should be able to:

A. Interpret and apply welding blueprints;
B. Illustrate welding joints and perform material layout;
C. Explain and apply geometric construction;
D. Explain and apply parallel line development;
E. Explain and apply radial line development;
F. Illustrate fit up of components for welding in the proper sequences to standard;
G. Select, understand, and properly use welding jigs, fixtures and holding devices;
H. Illustrate control of weld distortion and defects;
I. Demonstrate proper methods and techniques for straightening;
J. Demonstrate rigging techniques;
K. Material handling safe practices
L. Practice the basics of SMAW, GMAW, GTAW, FCAW, Plasma and oxy-fuel cutting.

V. CONTENT:
A. Use and application of welding blueprints
    1. Assembly drawings
    2. Detail drawings
    3. Sections
    4. Dimensions and tolerances
    5. Bill of materials
B. Weld joint prep and material layout
    1. Grinder
    2. Oxy-fuel
    3. Plasma
    4. Carbon arc
    5. Linear measurements and tools
    6. Angular measurements and tools
    7. Proper joint details and fit-up per AWS codes

C. Geometric construction
    1. English measurements
    2. Metric measurements
    3. Linear dimensions and duplication
    4. Angular dimensions and duplication
    5. Construction of basic geometric shapes
    6. Basic trigonometry
D. Parallel line development
    1. Use in round pipe tubing and ducting
    2. use in square and rectangular tubing and ducting
E. Radial line development
    1. Cone layout
    2. Square and rectangular chutes and hoppers
    3. Square to round transitions
F. Correctly fit-up components for welding in the proper sequences
    1. Project planning
    2. Dimensional control
    3. Angular control
    4. Planning for access
    5. Welding positions
G. Select, understand, and properly use welding jigs, fixtures and holding devices
    1. Welding jigs and fixtures
    2. Welding platens
    3. Wedges and dogs
    4. Screw clamps
    5. Hydraulic clamps and jacks
    6. Pneumatic clamps and jacks
H. Control weld distortion and defects
    1. Prebending
    2. Distortion control using localized heat
    3. Stress relief and normalizing
    4. Welding
I. Proper methods and techniques for straightening
    1. Hand tools
    2. Heat
    3. Pressure
    4. Machine allowance
J. Rigging
    1. Wire rope
    2. Nylon slings
    3. Chains
    4. Eye bolts
    5. Shackles
    6. Pad eyes
    7. Center of gravity
    8. Bridge cranes
    9. Jib cranes
    10. Gantry cranes
    11. Mobile cranes
    12. Tower cranes
K. Material handling safety
    1. Forklift use
    2. Safe lifting techniques
    3. Dunnage
    4. Slings
L. Welding and cutting basics
    1. SMAW
    2. GMAW
    3. GTAW
    4. FCAW
    5. Plasma cutting
    6. Oxy-fuel cutting

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. Visual presentations
C. **Field Trips** -
D. Invited guests
E. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:
A. Read chapter related to radial line development B. Discuss the chapter content C. Use the information in the chapter to layout and form a cone in lab

VIII. EVALUATION:
A. **Methods**

1. Exams/Tests
2. Quizzes
3. Class Participation
4. Lab Activities
5. Other:
    a. Methods:
        1. Class participation
        2. Safe operation in laboratory and safe use of equipment
        3. Quality and quantity of work produced
        4. Quizzes
        5. Exams

B. **Frequency**

IX. TYPICAL TEXTS:

1. Budzik, Richard *Practical Sleet Metal Layout*., Practical Publications, 1996.
2. Stewart, John P *Welding/Fitters Guide*., Audel Books, 1979.
3. McConnell, Charles N *Pipe Fitters Packet Manual.*, Audel Books, 2003.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Personal protective equipment
B. Welding gloves
C. Welders safety glasses
D. Leather boots or shoes
E. Tungsten
F. Calculator with Trig functions