WLDG 1435  
Introduction to Pipe Welding (SMAW)

Semester Hours:  
4

Textbook:  
Modern Welding, Althouse, Turnquist, Bowditch

Course Description:  
An introduction to welding of pipe using the shielded metal arc welding process (SMAW), including electrode selection, equipment setup, and safe shop practices. Emphasis on weld positions 1G and 2G using various electrodes.

Course Learning Outcomes:  
The student will describe equipment and required pipe preparation and perform 1G and 2G welds using various electrodes.

Supplementary Material:  
Filmstrips  
Handout material  
Videos

Performance Objectives:
1. Given instructions and practice the student will be able to setup and check for leaks on oxyacetylene station and use at least three types of pipe beveling techniques used in the industry. This knowledge will be evidenced by laboratory demonstrations, completion of assignment sheets, and by scoring the college minimum satisfactory grade on a written exam.
   
   A. Demonstrate how to assemble an oxyacetylene rig and to test for leaks by using soap and water. The student must strive to assemble the rig without leaks.
   
   B. Prepare pipe nipples for welding with an oxyacetylene torch and chain gear and electric pipe beveling machines.
   
   C. Bevel pipes to a 30 degree or 37 1/2 degree bevel and tack them together with a 1/8" gap within a 1/16" tolerance.

2. Given instructions and practice the student will be able to run a stringer bead and finish welding two pipe nipples in the 1G, and 2G position. This knowledge will be evidenced by laboratory demonstration, completion of assignment sheets, by destruction testing using the American Welding Society code specifications, and by scoring the college minimum satisfactory grade on a written exam.
   
   A. Run a stringer bead and finish welding two pipe nipples in the 1G position.
B. Run a stringer bead and finish welding two pipe nipples in the 2G position.

**Teaching Methods:**

1. Handout material
2. Demonstrations
3. Individual and group instruction in the lab
4. Groups of two or three students will work together on a lab project

**Evaluation Methods:**

1. Attendance
2. Written Exams
3. Lab work
4. Tolerance of finished work
5. Destructive method by bending test straps in guided bend tester

**Grading Policy:**

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<tr>
<th>Lecture Evaluation</th>
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<td>Practical Application (Lab)</td>
<td>80%</td>
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**Attendance Policy:**

Students must attend all classes. Excessive absenteeism will have a detrimental effect on the student grade. Students can be dropped from classes for excessive absenteeism. The instructor will call roll at the beginning and end of each class or any time he/she feels it necessary. Three (3) times tardy will count as one (one) absence. The attendance record starts the first day of class beginning of each semester.

**Course Outline:**

I. Oxyacetylene Cutting and Welding Theory and Practice

A. Different types of cutting and welding
B. The oxyacetylene equipment
C. Assembling oxyacetylene equipment
D. Lighting equal pressure types torch
E. Torch adjustments
F. The oxyacetylene cutting process
G. Cutting attachments and cutting tips
H. Cutting different kinds and thicknesses of metals
II. Prepare Pipe Nipples
   A. Flame cut pipe nipples with 30 degree bevel
   B. Prepare pipe nipples with a landing by grinding or hand filing
   C. Set the correct gap between two pipe nipples and prepare for welding

III. 1G Position
   A. Tack weld two pipe nipples and set them the 1G position
   B. Run a stringer bead with 6010 electrodes or 6011 electrodes and finish welding with 7018 electrodes

IV. 2G Position
   A. Tack weld two pipe nipples and set them in the 2G position
   B. Run a stringer bead with 6010 electrodes or 6011 electrodes and finish welding with 7018 electrodes.

COMPETENCY PROFILE
(rev.8/10)

STUDENT ___________________________  COURSE WLDG 1435

INSTRUCTOR _________________________  SEM./YEAR ___________________

RATING SCALE:
4 Skilled: Can work independently with no supervision.
3 Moderately Skilled: Can perform job completely with limited supervision
2 Limited Skill: Requires instruction and close supervision.
1 No Exposure: No experience or knowledge in this area.

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<tbody>
<tr>
<td>Prepare material for correct weld procedure.</td>
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<tr>
<td>Identifies and selects correct electrode</td>
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<td>Sets welding current for correct weld procedure.</td>
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<td>Makes V-groove, butt joint test weld with the pipe axis in the horizontal test position, and the pipe rotated. (1G)</td>
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<tr>
<td>Makes V-groove, butt joint, test weld in the horizontal (bellhole) test position. (2G)</td>
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<td>Prepares weld for test.</td>
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<td>Passes visual test.</td>
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<td>Passes destructive test.</td>
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