COASTAL BEND COLLEGE
WELDING
SYLLABUS
(Rev.11-13)

WLDG 1434: Introduction to Gas Tungsten Arc (GTAW) Welding

Semester Hours: 4


Course Description: Introduction to the principles of gas tungsten arc welding, setup/use of GTAW equipment, and safe use of tools and equipment. Welding instruction in various positions on joint designs.

Course Learning Outcomes: Principles of gas tungsten arc welding (GTAW), including setup, GTAW equipment. Instruction in various positions and joint designs.

Supplementary Material: Filmstrips, Video films, and handout material

Performance Objectives:

1. Given instructions and practice the student will be able to name the various shielding gases, methods of metal transfer, and components of a GTAW station. 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. Name the four most common inert gases used in GTAW

   B. Name the main components of the GTAW outfit.

2. Given instructions and practice the student will select shielding gases for mild steel and setup a GTAW station. 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. Select the proper gas or gas mixture necessary to shield various metals while welding the GTAW process.

   B. Adjust gas mixture and flow rate necessary to shield the arc while welding with the GTAW process.
3. Given instructions and practice the student will be able to setup a GTAW station and make the necessary adjustments such as current, voltage, and gas flow necessary to weld on various sizes of plate.
   
   A. Assemble the components such as booth, welding machine, flowmeter, GTAW torch, control system, and setup a complete GTAW outfit. Safety will be stressed.
   
   B. Inspect welding station for safety such as electrical shock, arc flash, and ventilation.

4. Given instructions and practice make welds on lap joints, T-cross, and bevel plates using the uphill methods of welding on plate. This knowledge will be evidenced by laboratory demonstrations, completion of assignment sheets, visual inspection test, destructive test according to the Welding Society welding codes, and by scoring the college minimum satisfactory grade on a written exam.
   
   A. Set machine and weld plate on a lap joint, in the flat (1F), horizontal (2F), vertical (3F), and overhead (4F) positions.
   
   B. Set machine and weld plates on a T-cross in the flat (1F), horizontal (2F), vertical (3F), and overhead (4F) positions.
   
   C. Set machine and weld on bevel mild steel plates with a V groove joint in the flat (1G), horizontal (2G), vertical (3G), and overhead (4G) positions.

**Teaching Methods:**

1. Individual and group instructions in the lab.

2. Group of two or three students will work together on lab projects.

3. Individual and group instruction in the classroom

**Evaluation Methods:**

1. Attendance

2. Lab tests and lab performance

3. Visual inspection

4. Destructive method using a guided bend tester

5. Written exams
**Grading Policy:**

Lecture Evaluation 20%
Practical Application (Lab) 80%

**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. Shielding Gases
   A. Argon
   B. Helium
   C. Nitrogen
   D. Carbon dioxide

II. GTAW outfit
   A. Welding machine
   B. Shielding gas cylinder
   C. Flowmeter and regulator
   D. Control system
   E. Manually held hand torch

III. Gas selection for mild steel and stainless steel

IV. Setup Welding station
   A. Assemble components
   B. Adjust Variables
   C. Check for safety

V. Practice GTAW on mild steel
   A. Lap joints
   B. T-cross
   C. V-groove
### COMPETENCY PROFILE

(Rev. 8/10)

**STUDENT**

**COURSE** WLDG 1434

**INSTRUCTOR**

**SEM./YEAR**

<table>
<thead>
<tr>
<th>RATING SCALE</th>
<th>Skilled:</th>
<th>Moderately Skilled:</th>
<th>Limited Skill:</th>
<th>No Exposure:</th>
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<tbody>
<tr>
<td>4</td>
<td>Can work independently with no supervision.</td>
<td>Can perform job completely with limited supervision</td>
<td>Requires instruction and close supervision.</td>
<td>No experience or knowledge in this area.</td>
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<th>COMPETENCY</th>
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<tr>
<td>Identifies and selects power source.</td>
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<td>Properly uses bench, and portable grinder.</td>
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<td>Identifies, selects, and safely handles shielding gases.</td>
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<td>Identifies, selects, shapes, and installs tungsten electrode.</td>
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<td>Sets welding current for correct weld procedure.</td>
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<td>Identifies welding problems, their causes, and takes corrective action.</td>
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<tr>
<td>Adjusts current, gas flow setting and strikes arc.</td>
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<td>Identifies, selects joint design, and prepares metal.</td>
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<td>Identifies base material selects filler rod.</td>
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<tr>
<td>Makes lap joint welds in the flat, horizontal, vertical, and overhead position.</td>
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<td>Makes fillet tee weld in the flat, horizontal, vertical, and overhead position.</td>
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<tr>
<td>Makes V-groove, butt joint plate weld in the flat position. (1G)</td>
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<td>Makes V-groove, butt joint plate weld in the horizontal position. (2G)</td>
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<tr>
<td>Makes V-groove, butt joint plate weld in the vertical position. (3G)</td>
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<tr>
<td>Makes V-groove, butt joint plate weld in the overhead position. (4G)</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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