I. DIVISION: Agriculture, Environmental Sciences, & Technical Education

PREFIX/NO.: WELD 200 COURSE TITLE: Arc & Gas Welding

Formerly listed as: __________________________ Date Changed: ____________

II. ALSO OFFERED AS:

Div: ______________ Prefix/No.: ______________ Title: __________________________

Div: ______________ Prefix/No.: ______________ Title: __________________________

III. COURSE INFORMATION:

Units: 3 or Variable Units: □ X=1/2 unit □ A=1 unit □ B=2 units □ C=3 units □ D=4 units

Total Hours: Lecture: 35 Lab: 62.5

Explain Other hours: ____________________________

Transfer Credit: CSU - □ UC - □ CAN - ______

General Ed: __________ AA/AS Area: ______ CSU GE Area: ______ IGETC Area: ______

Offered Only: Fall - □ Spring - □ Summer - □ Eve - □ Not offered every semester - □

IV. PREREQUISITE(S)/COREQUISITE(S)/RECOMMENDED FOR SUCCESS:

(Please check all that apply and list below. Also attach appropriate documentation forms)

Prerequisite (P) - □ Corequisite (C) - □ Recommended for Success (R) - □ Limitation on Enrollment (L) - □

V. CATALOG DESCRIPTION:

Introduction and basic instruction in theory and techniques in oxy-acetylene welding and cutting and shielded metal arc welding. Safety and machine operation in the welding shop will be presented in lecture as well as "hands on" laboratory experiences.

VI. FIELD TRIPS REQUIRED? Yes □ No □ Maybe □

VII. GRADING: A-F Only □ CR/NC Only □ CR/NC Option □ Non-Graded □

VIII. REPEAT PROCEDURES: Credit: No □ *Yes □ Maximum Completions: ______ Maximum Units: ______

Non-Credit: No □ Yes □ Maximum Completions: ______

*(If course is repeatable, attach a memo with the appropriate justification)

IX. EXPLAIN FEE REQUIRED: Welding rod required.

rev: 5/2002
X. PREREQUISITE SKILLS
Before entering the course, the student will be able to:

XI. OBJECTIVES (Expected outcomes for students)
Upon successful completion of the course, the student will be able to:

A. Identify and describe welding and cutting processes.
B. Determine what parts and equipment are assembled to make an oxy-fuel gas station.
C. Describe how the oxy-fuel parts are constructed and assembled.
D. Demonstrate the safe use of the oxy-fuel and cutting equipment.
E. Differentiate between the basic tip sizes and filler rod sizes and designate the specific applications of each.
F. Apply welding techniques to various thickness of steel with the oxy-fuel cutting torch.
G. Demonstrate an ability to cut various thickness of steel with the oxy-fuel cutting torch.
H. Identify the various types of Submerged Metallic Arc Welding (SMAW) machines and determine the various accessories required for SMAW.
I. Match examples of the correct selection of welding current and electrode to various materials.
J. Demonstrate the safety procedures and precautions required when working with various arc welding processes such as SMAW, (GTAW) Gas Tungsten Arc Welding, and (GMAW) Gas Metal Arc Welding.
K. Describe the fundamentals of the shielded metal arc welding (SMAW).
L. Demonstrate how to strike an arc, run a bead, and "read a bead."
M. Practice and demonstrate SMAW.

XII. CONTENT

A. Welding Fundamentals
   1. Oxy-fuel
   2. Shielded metal arc welding
   3. Flux cored arc welding
   4. Gas tungsten arc welding

B. A.W.S. (American Welding Society) Abbreviations
   1. OFC (Oxy-fuel cutting)
   2. GMAW
   3. GTAW
   4. SMAW

* = Multi-cultural objective or content item

Rev 5/2002
C. Oxy-fuel processes (OFW)
   1. Equipment and supplies welding
      a. Cylinders
      b. Torches
      c. Check valves
   2. Shop safety cutting and welding
      a. Lens selection
      b. Protective clothing
      c. Use of proper tools
      d. Equipment maintenance
   3. Cutting mild steel plate
      a. Torch handheld / machine
      b. Pressure selection
      c. Holding the torch
      d. Shutting down the torch
      e. Evaluation of torch cutting

D. Shielded Metal Arc Welding (SMAW)
   1. SMAW equipment and supplies
      a. Machines AC/DC
      b. Welding leads
      c. Amperage curves
      d. Polarities AC/DC
   2. Arc welding safety equipment
      a. Lens shade
      b. Protective clothing
      c. The arc hood
      d. Arc light density
   3. Electrode selection
      a. AWS codes
      b. Amperage vs. electrode size
      c. "F" groups
      d. Electrode coding secrets
      e. Proper electrode vs. proper position

* = Multi-cultural objective or content item
WELD 200 Arc & Gas Welding

4. Welding positions
   a. Striking the arc
   b. Crater development and filling
   c. Picking up the bead (tie-ins)
   d. Overlapping beads
   e. Cleaning the weld

XIII. TEACHING METHODS
A. Methods to achieve course objectives:
   1. Class lecture and lab demonstrations
   2. Outside assignments from technical manuals specific to individual topics.
   3. Self study, film strip-assisted instructional units in safety, problem solving and welding procedures.
   4. Demonstrate the mastery of each competency by the successful completion of related lab project.

B. Typical assignments used in achieving learner independence and critical thinking:
   1. Provide a written report on the completed welding unit.
   2. Prior to actual welding, the student will compose a procedure to define the steps needed to obtain the prescribed results.

XIV. TEXTBOOKS AND OTHER READINGS (Typical)
A. Required texts:
   Modern Welding, Bowditch, Goodheart-Wilcox Co., Inc.

B. Other readings:

XV. SPECIAL STUDENT MATERIALS (i.e., protective eyewear, aprons, etc.)

None

XVI. METHODS OF EVALUATING STUDENT PROGRESS
A. Class presentations
B. Group discussions
C. Written unit examinations to include essays
D. Descriptive lab analysis
E. Task performance by industrial standards
F. Problem solving exercises

* = Multi-cultural objective or content item

Rev 5/2002
Instruction Materials Fee Compliance

Based on a Chancellor's Office Legal Opinion (http://www.cccco.edu/divisions/legal/opinions/attachments/02-31.pdf) the following questions should be answered any time a district wishes to require students to provide materials:

1. What tangible personal property (material) does the student need? If a fee is charged, what does the student "get" for the fee?
2. How does this material relate to the required objectives of the course? The district should be able to identify a specific course objective that cannot be met but for the use of the materials at issue.
3. Does the material have continuing value outside the classroom?
4. Is the amount of materials the students must supply, or the amount that they receive in exchange for the fee that is charged, consistent with the amount of material necessary to meet the required objectives of the course?
5. A. If the district charges a fee rather than have students furnish the materials, why do the students have to pay a fee to the district rather than supply the materials themselves?
   B. Is the district the only source of the materials?
   C. If not, is there some health or safety reason for the district to supply the materials?
      If not, will the district supply the material more cheaply than the material can be obtained elsewhere AND at the District's actual cost?

To meet this requirement, all courses with a materials fee or requirement for student-supplied materials must complete the forms below (examples provided).

Instructional Materials Fee Report
Modesto Junior College

<table>
<thead>
<tr>
<th>Course: WELD 204</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material for student Metal Student Projects</td>
</tr>
</tbody>
</table>

Inventory & Costs for: WELD 204 Students are charged a fee of: $15.00
Costs if Items Were Purchased Individually:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount/Student</th>
<th>Cost Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIG &amp; Flux Combination T-Joint Project (Flat)</td>
<td>1</td>
<td>$5.00</td>
</tr>
<tr>
<td>MIG &amp; Flux Combination T-Joint Project (Horizontal)</td>
<td>1</td>
<td>$5.00</td>
</tr>
<tr>
<td>MIG and Flux Combination T-Joint Project (Vertical)</td>
<td>1</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

**TOTAL** $15.00