I. **OVERVIEW**

The following information will appear in the 2011 - 2012 catalog

WELD 206  **Gas Tungsten Arc Welding (G.T.A.W.)**  3 Units

*Also offered as:* MFGA - 206: Gas Tungsten Arc Welding (G.T.A.W.)
*Formerly listed as:* WELD - 206: Gas Tungsten Arc Welding (TIG)

**Prerequisite:** Satisfactory completion of WELD 200.

Advanced occupational course covering welding procedures for ferrous and non-ferrous sheetmetals and purge welding procedures for stainless steel tubing.

**Materials Fee Required**

Field trips might be required.  (A-F or P/NP - Student choice) Lecture /Lab

**Transfer:** (CSU)

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   a. GTAW Equipment
   b. Power Supplies
   c. Filler Rods
   d. Joints
   e. Metal Properties
   f. Shield Gases
   g. Operational Variables

2. **Required Lab Content:**

   a. Mild steel sheetmetal: job sheets - 1A, 1B, 1C, 1D
   b. Stainless steel sheetmetal: job sheets - 1A, 2B, 2C, 2D
   c. Aluminum sheetmetal: job sheets - 3A ,3B, 3C, 3D
   d. Stainless steel tubing: jobsheets - 4A, 4B, 4C, 4D

B. **ENROLLMENT RESTRICTIONS**

1. **Prerequisites**
Satisfactory completion of WELD 200.

2. **Requisite Skills**  
*Before entering the course, the student will be able to:*

a. Set and adjust the controls of a constant current power source for GTAW.

b. Understand and develop the 5 basic joints illustrated in job sheets 1-A thru 1-D, 2-A thru 2-D, 3-A thru 3-D.

c. Place the required weld joints in the required positions for welding exercises.

3. **Health and Safety Skills/Restrictions**  
*Before entering the course, the student must demonstrate the following skill or condition:*

a. Understanding of general metal shop and electric welding safety

C. **HOURS AND UNITS**

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D. **METHODS OF INSTRUCTION (TYPICAL)**  
*Instructors of the course might conduct the course using the following method:*

1. Classroom lectures  
2. Lab demonstrations  
3. Review of supplementary industry based handouts.  
4. Use of multimedia videos, slide presentations.  
5. Guest speakers from industry.  
6. Lab review and feedback of student work during lab times.

E. **ASSIGNMENTS (TYPICAL)**

1. **EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS**  
*Time spent on coursework in addition to hours of instruction (lecture hours)*

   a. Weekly reading assignments  
   b. Weekly homework assignments  
   c. Semester industry/worksite projects  
   d. Prepare for semester safety exam  
   e. Prepare for semester final exam  
   f. Study for periodic quizzes  
   g. Periodic lab project assignments
2. **EVIDENCE OF CRITICAL THINKING**
   *Assignments require the appropriate level of critical thinking*
   
a. **Home work:** The GTAW Handbook states that even though shield gases are odorless and colorless, they are still dangerous because...
   
b. **Mid-term examination:** A GTAW power source set up with A/C and high frequency on continuous is set to weld... a. aluminum b. magnesium c. stainless steel d. both a and b are correct
   
c. **Laboratory instruction:** Students are given job sheets that include both written instructions and graphic illustrations. They must interpret the written instructions to set equipment parameters, and the illustrations to fabricate the required projects.

F. **TEXTS AND OTHER READINGS (TYPICAL)**

1. Other: Gas Tungsten Arc Welding, Good Heart/ Wilcox, 2000

III. **DESIRED LEARNING**

A. **COURSE GOAL**
   *As a result of satisfactory completion of this course, the student should be prepared to:*
   
   explain and practice the basic procedures and concepts of operation with the GTAW and OFC equipment and process; explain and practice fundamental safety rules of the GMAW and OFC equipment and process; comprehend and develop welds, weld joints and welding positions from the instructions of job sheets JS-1A through JS-4D.

B. **STUDENT LEARNING GOALS**
   *Mastery of the following learning goals will enable the student to achieve the overall course goal.*

1. **Required Learning Goals**
   *Upon satisfactory completion of this course, the student will be able to:*
   
a. Explain the physical characteristics of shielding gases used in GTAW.
   
b. Distinguish the properties of different metals and identify them.
   
c. Apply the safety procedures and precautions required when working with GTAW.
   
d. Describe the functions of the welding machines used for GTAW.
   
e. Discriminate between shielding gases accessory equipment, and electrode used in GTAW.
   
f. Setup the needed power sources shielding gases, torch, nozzles, and tungsten electrodes used in GTAW.
   
g. Prepare a weld joint and perform various welds in all positions.

2. **Lab Learning Goals**
   *Upon satisfactory completion of the lab portion of this course, the student will be able to:*
   
a. Use the appropriate equipment and materials to develop the welds and weld joints illustrated on job sheet #2-A
   
b. Use the appropriate equipment and materials to develop the welds and weld joints illustrated on job sheet #3-A
IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT

1. Class Participation
2. Quizzes
3. Assessment of student ability to follow safety and work environment procedures
4. Evaluation of quality of welds
5. Assessment of student ability to set up equipment and operations.
6. Safety Exam

B. SUMMATIVE ASSESSMENT

1. Assessment of student completion and quality of all assigned laboratory assignments
2. Final examination