Cerro Coso College

Course Outline of Record Report

10/07/2021

WELDC203 : Gas Tungsten Arc Welding (GTAW)

General Information

Author:	• David Villicana • O'Connor, James • Dorrell, Mike
Course Code (CB01) :	WELDC203
Course Title (CB02) :	Gas Tungsten Arc Welding (GTAW)
Department:	Industrial Arts
Proposal Start:	Spring 2019
TOP Code (CB03) :	(0956.50) Welding Technology
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Course Control Number (CB00) :	CCC000504288
Curriculum Committee Approval Date:	11/01/2013
Board of Trustees Approval Date:	12/19/2013
External Review Approval Date:	03/10/2014
Course Description:	This course provides practical experience in Gas Tungsten Arc Welding (GTAW) as well as lectures on safety, welding and identification of exotic metals, types of filler metals and shielding gasses. There is a $40 materials fee associated with this course.
Submission Type:	Mandatory Revision Cyclic review. One revision was made to SLO #3 to streamline the assessment process. Updated text.
Author:	No value

Faculty Minimum Qualifications

Master Discipline Preferred:	No value
Alternate Master Discipline Preferred:	No value
Bachelors or Associates Discipline Preferred:	• Welding
Additional Bachelors or Associates Discipline Preferred:	• Welding

Course Development Options

Basic Skills Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grade Options

- Letter Grade Methods
- Pass/No Pass

Allow Students to Gain Credit by

Allowed Number of Retakes

Course Prior To College Level (CB21)

Allow Students to Gain Credit by Exam/Challenge

0

Not applicable.

Rationale For Credit By Exam/Challenge

No value

Retake Policy Description

Type:|Non-Repeatable Credit

Allow Students To Audit Course

Course Support Course Status (CB26)

No value

Associated Programs

Course is part of a program (CB24)

Associated Program	Award Type	Active
CC Welding Technology	A.S. Degree Major	Summer 2018

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

No value

Transferability

Transferable to CSU only

Transferability Status

Approved

Units and Hours

Summary

Minimum Credit Units (CB07)	2
Maximum Credit Units (CB06)	2
Total Course In-Class (Contact) Hours	72
Total Course Out-of-Class Hours	36
Total Student Learning Hours	108
Faculty Load	0

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Status (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Classs
Lecture Hours	1	2
Laboratory Hours	3	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	18
Laboratory	54
Activity	0
Total	72
Course Out-of-Class Hours	
Lecture	36
Laboratory	0
Activity	0
Total	36

Time Commitment Notes for Students

Students will be expected to complete homework assignments, study handouts and lecture material.

Faculty Load

Extra Duties: 0

Faculty Load: 0

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

WELDC102 - Shielded Metal Arc Welding

The student must utilize the knowledge of electrical safety and hazards of ultraviolet light learned in the WELD C102 while operating Gas Tungsten Arc Welding equipment in the WELD C203 course. Skill building exercises in the WELD C102 are necessary for development of hand/eye coordination during the WELD C203 course.

AND

Prerequisite

WELDC200 - Gas Metal Arc Welding (GMAW)

The student needs the skills learned in the WELD
C200 that include safe handling and use of high pressure shielding gas cylinders, regulators and flow meters which are used in the WELD C203 class to provide shielding for the molten weld pool during Gas Tungsten Arc Welding process (GTAW). Advanced welding techniques learned in the WELD C200 class are needed to perform the exercises encountered in the WELD C203 course.

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Other
Rationale	Textbook tutorials Practical exercises
Methods of Instruction	Demonstration
Rationale	Students will learn the proper torch angle for a 2F (horizontal) tee joint. Students will learn how properly weld a 1G (flat) butt joint.
Methods of Instruction	Lecture
Rationale	Students will learn the importance of properly cleaning aluminum before welding. Students will learn how to properly shape the tungsten before welding. Students will learn how to identify the proper shielding gas flow rates.

Assignments

Example: Review Chapter 15 (Gas Tungsten Arc Welding Equipment, Setup, Operation, and Filler Metals) of assigned textbook for upcoming quiz.
Properly setup the TIG welding machine based on certain metal types and thickness.
Perform a sound weld in a lap joint in the 3F (vertical) position.
Perform a sound weld in a tee joint in aluminum and mild steel in all positions.
Demonstrate how to properly shape the tungsten based on the type of material being welded.
Identify and properly label the parts that make up a TIG torch.
Perform a sound weld in an outside corner joint in the 1G (flat) position.

Methods of Evaluation	Rationale
Other	Practical assignments. Example: Students perform an outside corner joint on both aluminum and carbon steel in the 1G flat position.
Tests	Quizzes on readings and handouts. Example: students complete true/false, multiple choice and fill in the blank questions that assesses knowledge of gas tungsten arc welding equipment.
Final Exam	Written exam. Example: Students complete a written final exam that covers the theory of gas tungsten arc welding Practical exam. Example: Students complete a practical final exam in which they perform welds in various joint configurations and positions.

Equipment

Students will need the appropriate personal protective epuipment (PPE) such as: Welding helmet, safety glasses, gloves, welding jacket or sleeves.

Textbooks

Author	Title	Publisher	Date	ISBN
Larry Jeffus	Welding Principles and Applications Eighth Edition	Cengage Learning	2017	978-1-305-46469-5

Other Instructional Materials

No Value

Materials Fee

Yes Fee: 40.00 Justification: The materials fee is to cover the cost of metal and consumables used for the projects that students can take home and is consistent with other welding courses in the program. Reference: Education Code section 76365 and title 5 regulations on instructional materials (§§ 59400-59408) Breakdown of costs per student: 1/8" mild steel $1.10/ft - 40' = $44 1/8" 6061 T6 aluminum $1.60/ft - 20' = $32 3/32" ER4043 filler wire $7.64/lb - 3 = $22.92 3/32" ER70S-6 filler wire $3.45/lb - 5 = $17.25

Learning Outcomes and Objectives

Course Objectives

No value

CSLOs

Practice clean and safe working habits that are consistent with trade practices to Occupational Health and Safety Administration (OSHA) standards.
Expected SLO Performance: 70.0

Identify the components, controls, and settings of a Gas Tungsten Arc Welding (GTAW) machine. Expected SLO Performance: 70.0

Determine the proper machine setup up, including welding current for the machine used, the types and sizes of tungsten, shielding gas flow rates, and the metal types and thicknesses. Expected SLO Performance: 70.0

Produce properly made Gas Tungsten Arc Welding (GTAW) welds in butt joints, lap joints, and tee joints in all positions that can pass the specified standard. Expected SLO Performance: 70.0

Outline

Course Outline

A. Safety
1. Burn classification
2. Face; eye; and ear protection
3. Respiratory protection
4. Ventilation
5. Special protective clothing
6. Fire protection
7. Electrical protection

B. Introduction
1. Tungsten
2. Types of tungsten electrodes
3. Shaping the tungsten
4. GTAW equipment
5. Types of welding current
6. Shielding gasses
7. Remote controls

C. Gas Tungsten Arc Welding of Plate
1. Torch angle
2. Filler rod manipulation
3. Tungsten contamination
4. Current setting
5. Gas flow

D. Practice Welds
1. Low carbon and mild steels
2. Stainless steel
3. Aluminum
4. Metal preparation

Lab Outline

A. Practical exercises to be performed using aluminum.
1. Stringer beads in the flat position flat 1G position.
2. Stringer bead pad in the 1G position
3. Outside corner joint in the 1G position
4. Butt joint in the 1G position
5. Lap joint in the 1F position
6. Tee joint in the 1F position
7. Stringer beads in the horizontal 2G position (45 degree)
8. Stringer beads in the horizontal 2G position (90 degree)
9. Butt joint in the 2G position
10. Lap joint in the 2F position
11. Tee joint in the 2F position
12. Stringer beads in the vertical 3G position (45 degree)
13. Stringer beads in the vertical 3G position (90 degrees)

14. Butt joint in the 3G position
15. Lap joint in the 3F position
16. Tee joint in the 3F position

B. Practical exercises to be performed using carbon steel.

1. Stringer beads in the flat 1G position
2. Outside corner joint in the 1G position
3. Butt joint in the 1G position
4. Lap joint in the 1F position
5. Tee joint in the 1F position
6. Stringer beads in the horizontal 2G position (45 degrees
7. Stringer beads in the horizontal 2G position (90 degrees)
8. Butt joint in the 2G position
9. Lap joint in the 2F position
10. Tee joint in the 2F position
11. Stringer beads in the vertical 3G position (45 degrees)
12. Stringer beads in the vertical 3G position (90 degrees)
13. Butt joint in the 3G position
14. Lap joint in the 3F position
15. Tee joint in the 3F position

Delivery Methods and Distance Education

Delivery Method: Please list all that apply -Face to face -Online (purely online no face-to-face contact) -Online with some required face-to-face meetings (“Hybrid”) -Online course with on ground testing -iTV – Interactive video = Face to face course with significant required activities in a distance modality -Other

Face 2 Face

Rigor Statement: Assignments and evaluations should be of the same rigor as those used in the on-ground course. If they are not the same as those noted in the COR on the Methods of Evaluation and out-of-class assignments pages, indicate what the differences are and why they are being used. For instance, if labs, field trips, or site visits are required in the face to face section of this course, how will these requirements be met with the same rigor in the Distance Education section?

No Value

Effective Student-Instructor Contact: Good practice requires both asynchronous and synchronous contact for effective contact. List the methods expected of all instructors teaching the course. -Learning Management System -Discussion Forums -Moodle Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV - Interactive Video -Other (specify)

No Value

Software and Equipment: What additional software or hardware, if any, is required for this course purely because of its delivery mode? How is technical support to be provided?

No Value

Accessibility: Section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden". I am using -iTV—Interactive Video only -Learning management system -Publisher course with learning management system interface.

Class Size: Good practice is that section size should be no greater in distance ed modes than in regular face-to-face versions of the course. Will the recommended section size be lower than in on-ground sections? If so, explain why.

No Value