Cerro Coso College

Course Outline of Record Report

10/07/2021

WELDC101 : Oxyacetylene Welding

General Information

Author:	• David Villicana • O'Connor, James • Dorrell, Mike
Course Code (CB01) :	WELDC101
Course Title (CB02) :	Oxyacetylene Welding
Department:	Industrial Arts
Proposal Start:	Spring 2019
TOP Code (CB03) :	(0956.50) Welding Technology
SAM Code (CB09) :	Possibly Occupational
Distance Education Approved:	No
Course Control Number (CB00) :	CCC000543248
Curriculum Committee Approval Date:	11/30/2012
Board of Trustees Approval Date:	02/14/2013
External Review Approval Date:	04/27/2013
Course Description:	In this course students gain practical experience in welding, brazing, soldering, and cutting of steel using oxyacetylene. Topics include safety, metals and their physical properties, setup and use of oxyacetylene equipment, and welding and cutting techniques. There is a $40 materials fee associated with this course.
Submission Type:	Mandatory Revision Cyclic review. Updated text. Added materials fee justification.
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)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162
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	2	4
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	36
Laboratory	54
Activity	0
Total	90
Course Out-of-Class Hours	
Lecture	72
Laboratory	0
Activity	0
Total	72

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

No Value

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
Methods of Instruction	Other
Rationale	Practical exercises
Methods of Instruction	Demonstration
Rationale	How to weld a corner joint in the 1G (flat) position. How to weld a lap joint in the 3F (vertical) position. How to cut using an oxy/acetylene torch.
Methods of Instruction	Laboratory
Rationale	Students will learn how to properly setup a manifold system using oxygen and acetylene. Students will learn the difference between a carburized, oxidizing, and neutral flame.
Methods of Instruction	Lecture
Rationale	Students will learn how to safely setup an oxy/acetylene torch. Students will learn the proper filler metals to use with certain types of metals. Students will learn the proper gas flow rates based on the metal thickness and torch tip sizes.

Assignments

A. Text readings.

Example: Intro to Chapter 33 Soldering, Brazing, and Braze Welding.

B.Homework Assignment Research Reports 500 words minimum.

Example: Personal protective equipment (PPE).
-Include topics such as: Which type/style will work best for your individual needs.
-Are the shaded lenses the proper shade for the job you will be performing?

Example: General work clothing.
-Include topics such as: What material/style is your special protective clothing?
-For example: do you need gloves that are single thickness or insulated? Are they 100% leather?
-Do you want driver style or gauntlet? How will your decisions effect your performance and safety?

C. Homework Assignment Observation Report 500 words minimum.

Example: Observe and record how many objects that you encounter during a typical day that are joined by welding.
-What type process was used: oxyacetylene welding (OAW), shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux core arc welding (FCAW), gas tungsten arc welding (GTAW), other?

D. Preparation for in-class quizzes and both practical and theory exams.

Methods of Evaluation	Rationale
Final Exam	F. Final written and practical exam. Example: Theory test question. Explain the term regulator creep and why it is potentially dangerous. Example: Final practical exam. Students are presented with a pre-assembled fixture. The students perform seven welds, 2F tee, 2F lap, 2G butt, 3F lap, 3G butt, 1G butt, and outside corner joint. It is a timed exam.
Homework	A. Instructor assigned homework and readings to supplement and augment class lectures and demonstrations. Example: Characteristics of the Oxyfuel flame. The oxyacetylene has three types of flames, carbonizing, oxidizing, and neutral. The carbonizing flame has an excess of fuel gas. The oxidizing flame has an excess of oxygen. The neutral flame has a balance of oxygen and fuel. B. The oxyacetylene flame has two distinct parts; the primary and secondary flame or the inner cone and the outer envelope. Although more heat is contained in the outer envelope the inner cone has a much higher temperature. The temperature of the neutral oxyacetylene flame is approximately 5589 dergees F (3087 degrees C). C. The by-product of all clean burning hydrocarbons is water vapor and carbon dioxide and because the outer envelope is rich in carbon dioxide it acts as a shield to prevent the molten weld pool from becoming contaminated by oxidation
Other	Practical assignments include making specific types of welds and flame cuts. Example: Joining mild steel using a horizontal lap joint welded in the 2F position.
Tests	E. Exams on readings and handouts. Example: Describe the purpose of MSDS. Give the acronym and what they are and how and when to use them. Example: Explain the designations for the following welding filler metals; RG45, BRCuZn, ER70S-6, RCI.

Equipment

Students will need to provide personal protective equipment (PPE) such as: Shade 5 face shield or goggles, welding gloves, welding jacket.

Textbooks

Author	Title	Publisher	Date	ISBN

Larry Jeffus	Welding Principles and Applications Eighth Edition	Cengage Learning	2017	978-1-305-49469-5

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. 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 to OSHA standards that are consistent with trade practices. Expected SLO Performance: 70.0

ISLOs Core ISLOs	Students who are completing a program will be prepared to engage in responsible citizenship at various levels.
Industrial Arts Default Department A.A. Degree for Transfer	1. Illustrate general and technical knowledge through the use of technical drawings, sketches, and basic computer skills. Assessment:This will be assessed by an exam.

Demonstrate proper care, handling and use of tanks, regulators, and torches. Expected SLO Performance: 70.0

Make a variety of oxyacetylene welds with and without filler rod, braze, and cut metal using a cutting torch. Expected SLO Performance: 70.0

Outline

Course Outline

A. Introduction
1. Welding Safety
2. Burn Classification
3. Face; Eye; and Ear Protection
4. Respiratory Protection
5. Ventilation
6. Special Protective Clothing
7. Fire Protection
8. Shop Orientation

B. Oxyfuel Welding and Cutting Equipment Setup and Operation

1. Pressure Regulators
2. Regulator Gauges
3. Safety Release Device
4. Fittings
5. Safety Precautions
6. Regulator Care and Use
7. Welding and Cutting Torches Design and Service
8. Mixing the Gasses
9. Torch care and Use
10. Welding and Heating Tips
11. Tip Care and Use
12. Reverse Flow and Flashback Valves
13. Care of Reverse Flow and Flashback Arresters
14. Hose and Fittings
15. Hose Care and Use
16. Backfires and Flashbacks
17. Types of Flames
18. Leak Detection

C. Oxyfuel Gasses and Filler Materials
1. Uses of the Oxyfuel Flame
2. Characteristics of the Oxyfuel Flame
3. Characteristics of the Fuel Gas Flame
4. Fuel Gasses
5. Flame Rate of Burning
6. Acetylene (C2H2)
7. Heat and Temperature
8. Liquefied Fuel Gasses
9. Pressure
10. Production
11. Temperature and Heat
12. MAPP
13. Propane and Natural Gas
14. Hydrogen
15. Filler Metals
16. Ferrous Metals
17. Mild Steel
18. Cast Iron

D. Soldering; Brazing; and Braze Welding
1. Advantages of Soldering and Brazing
2. Physical Properties of the Joint
3. Fluxes
4. Soldering and Brazing Methods
5. Filler Metals
6. Joint Design
7. Building Up Surfaces and Filling Holes
8. Silver Brazing
9. Soldering

E. Flame Cutting
1. Metals Cut by the Oxyfuel Process
2. Eye Protection for flame Cutting
3. Cutting Torches and Tips
4. Oxyfuel Cutting; Setup; and Operation
5. Selecting the Correct Tip and Setting the Pressure

Lab Outline

Students complete guided tutorials and perform practical exercises during lab.
A. Equipment Set Up
1. Setting Up an Oxyfuel Torch Set
2. Turning On and Testing a Torch

3. Lighting and Adjusting an Oxyacetylene Flame
4. Shutting Off and Disassembling Oxyfuel Welding Equipment

B. Oxyacetylene Welding
1. Mild Steel Welds
2. Factors Affecting the Weld
3. Characteristics of the Weld
4. Practice
5. Pushing a Molten Weld Pool
6. Beading
7. Stringer Bead Flat Position
8. Practice
9. Outside Corner Joint
10. Practice
11. Butt Joint, Flat Position
12. Butt Joint w/ 100% Penetration
13. Butt Joint w/ Minimum Distortion
14. Practice
15. Lap Joint
16. Tee Joint
17. Out of Position Welding
18. Practice
19. Vertical Welds
20. Butt Joint
21. Lap Joint
22. Tee Joint
23. Horizontal Welds
24. Practice
25. Horizontal Stringer Beads
26. Butt Joint
27. Lap Joint
28. Tee Joint

Oxyfuel cutting
1. Flat cut
2. Cutting holes
3. Beveling
4. Vertical Straight

Brazing
1. Brazed Stringer Bead
2. Brazed Butt Joint
3. Brazed Tee Joint
4. Brazed Lap Joint
5. Soldered Tee Joint
6. Soldered Copper Pipe

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