Cerro Coso College

Course Outline of Record Report

10/07/2021

WELDC210 : Welding Fabrication

General Information

Author:	• David Villicana • Lee, Travis • Dorrell, Mike
Course Code (CB01) :	WELDC210
Course Title (CB02) :	Welding Fabrication
Department:	Industrial Arts
Proposal Start:	Fall 2021
TOP Code (CB03) :	(0956.50) Welding Technology
SAM Code (CB09) :	Advanced Occupational
Distance Education Approved:	No
Course Control Number (CB00) :	CCC000561300
Curriculum Committee Approval Date:	03/20/2015
Board of Trustees Approval Date:	05/07/2015
External Review Approval Date:	04/07/2015
Course Description:	This course enables students to construct welded projects using the processes learned in previous welding courses. The student learns to read technical drawings, interpret welding symbols, produce shop drawings, and use trade-related math in the layout and assembly process.
Submission Type:	Mandatory Revision This course is being revised for cyclic renewal. This course was last assessed in Fall 2017. WELD C210 will be reassessed in Spring 2021.
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 Formerly Known As

Course Formerly Known As

No Value

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 Exam/Challenge

Allowed Number of Retakes

0

Course Prior To College Level (CB21)

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)

Course is not a support course

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)

Y

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

No value

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 C102 course while performing various exercises assigned in the C210 course. Skill building exercises acquired in the C102 course are necessary in order to succeed in the advanced projects assigned in the C210 course.

AND

Prerequisite

WELDC200 - Gas Metal Arc Welding (GMAW)

The student needs the skills learned in the C200 course that include safe handling and use of high pressure shielding gas cylinders, regulators, and flow meters which are used in the WELD C210 course to provide shielding for the molten weld pool during the various welding processes. Advanced welding techniques learned in the WELD C200 course are needed to perform the exercises encountered in the WELD C210 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	Discussion
Rationale	Students will be expected to participate in class discussions.
Methods of Instruction	Group Work
Rationale	Students will be given group projects to complete throughout this course.

Methods of Instruction	Laboratory
Rationale	There is a laboratory component to this course where students will complete assigned practical projects.

Methods of Instruction	Lecture
Rationale	Students will be required to listen to lectures on course material.

Assignments

Textbook readings and homework assignments. Example: Homework assignment on computing area and perimeter of trapezoids. Example: Homework assignment using conversions. Example: Homework assignment using measuring tapes, vernier calipers, and micrometers. Example: Homework assignment on making a three view drawing using a simple sketch.

Methods of Evaluation	Rationale
Tests	Quizzes on readings and handouts. Example: Quiz on Chapter 2, Safety in Welding. Instructor assigned homework on measurements, basic math skills, etc.
Project	Practical assignments. Example: Layout and assemble an instructor assigned project. Example: Complete D1.1 destructive structural test in the 1G and 3G positions.
Final Exam	3. Final written and practical exam. Example: Exam on all subjects taught throughout the semester. Perform multi position welds on a prefabricated fixture.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Larry Jeffus	Welding Principles and Applications	Cengage	2021	0357377656

Other Instructional Materials

No Value

Materials Fee

Yes Fee: 50.00 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) List of materials and costs per student example: 1. Flat hot rolled carbon steel 3/8"x8"x5' @ $6.24/ft. = $31.20 2. Flat hot rolled carbon steel 1/4"x4"x5' @ $2.60/ft. = $13.00 3. 2lb. E7018 1/8" low hydrogen welding electrodes @ $3.27/lb.= $5.64 4. 3.5lb. E6010 1/8" 5P+ welding electrodes @ $3.57/lb.= $12.50 Total=$62.34

Learning Outcomes and Objectives

Course Objectives

No value

CSLOs

Practice safe working habits in a manner consistent with Occupational Safety and Health Administration (OSHA) regulations.

Expected SLO Performance: 70.0

Interpret and sketch technical drawings.

Expected SLO Performance: 70.0

ISLOs Core ISLOs	Students who are completing a program will be able to access, evaluate, and effectively use information.

Employ basic trade math during project layout and fabrication.

Expected SLO Performance: 70.0

Calibrate proper layout and fitting procedures for welding of structural shapes.

Expected SLO Performance: 70.0

Construct welded projects to a high level of accuracy.

Expected SLO Performance: 70.0

ISLOs Core ISLOs	Students who are completing a program will be able to think critically and creatively and apply reasoning.

Outline

Course Outline

A. Weld Joint Design
    1. Joint type
    2. Edge preparation
    3. Joint dimensions
    4. Welding process
    5. Base metal
    6. Plate welding positions
    7. Pipe welding positions
    8. Metal thickness
    9. Code or standards requirements
    10. Welder skill
    11. Acceptable cost
B. Mechanical Drawings
    1. Lines
    2. Types of drawings
    3. Projection drawings
    4. Special views
    5. Dimensioning
C. Welding Symbols
    1. Indicating types of welds
    2. Weld location
    3. Location significance of arrow
    4. Fillet welds
    5. Plug welds
    6. Spot welds

7. Seam Welds
8. Groove welds
9. Backing
10. Flanged welds
11. Nondestructive testing symbols

D. Fabrication layout
1. Safety
2. Shop math
    a. Measuring
    b. Tolerances
    c. Basic math
    d. Conversions
    e. Charts
    f. Basic geometry
3. Structural shapes
4. Layout square; rectangular; and triangular shapes
5. Laying out circles; arcs; and curves
6. Nesting
7. Bill of materials
8. Kerf space
9. Material shapes

E. Assembly
1. Clamps
2. Fixtures
3. Fitting
4. Tack welding
5. Welding
6. Finishing

Lab Outline

A. Identifying workplace hazards.
1. Collection of steel
2. Welding electrode stubs
3. Wire and cables

B. Demonstrating appropriate mechanical safety.
1. Hand tools
2. Electrical grinders
3. Drills
4. Metal cutting machines
5. Shears and punches

C. Practice applying and using appropriate personal protection equipment (PPE) including face; eye; hearing; respiratory; and special protective clothing.
1. Welding gloves
2. Safety glasses
3. Ear plugs
4. Welding respirators
5. Natural ventilation
6. Forced ventilation
7. Welding leathers

D. Using powered and non-powered tools including: General purpose; mechanical; metalworking; and measuring instruments.
1. Chipping hammers
2. Wire brushes
3. Center punches
4. Hammers
5. Electric grinders
6. Metal shear
7. Measuring tape
8. Vernier calipers

E. Students will construct instructor assigned projects using blueprints.
1. Three view drawings.
2. Sketching
3. Dimensioning

4. Welding symbols
5. Tolerances
6. Bill of materials
7. Kerf space

Delivery Methods

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 to 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? Describe the ways in which instructor-student contact and student-student contact will be facilitated in the distance ed environments.

No Value

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 -Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV - Interactive Video -Other

- Face-to-face meeting(s)

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.

No Value

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

Emergency Distance Education Options The course will operate in remote delivery mode when all or part of the college service area is under an officially declared city, county, state, or federal state of emergency, including (check all that apply) - Online including all labs/activity hours - Hybrid with online lecture and onsite lab/activity hours - Correspondence education in high school and prison facilities - None. This course will be cancelled or paused if it cannot be held fully onsite.

- Hybrid with online lecture and onsite lab/activity hours