

Bakersfield College
Course Outline of Record Report
 09/06/2021

WELDB53AN : Shielded Metal Arc Welding

General Information

Author:	<ul style="list-style-type: none"> Klint Rigby
Attachments:	WELD B53ANC Critical Thinking Assignment.docx WELD B53ANC AssessmentMappingForm.docx WELD B53ANC.docx
Course Code (CB01) :	WELDB53AN
Course Title (CB02) :	Shielded Metal Arc Welding
Department:	Welding
Proposal Start:	Spring 2022
TOP Code (CB03) :	(0956.50) Welding Technology
CIP Code:	(48.0508) Welding Technology/Welder
SAM Code (CB09) :	Advanced Occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000625328
Curriculum Committee Approval Date:	06/03/2021
Board of Trustees Approval Date:	07/08/2021
External Review Approval Date:	07/01/2022
Course Description:	Basic arc welding theory and manipulative skills related to the shielded metal arc welding process, including welding in all positions with various electrodes.
Submission Rationale:	Add Distance Education This course requires different coding to be allowed as an online/hybrid offering.
Author:	No value

Minimum Qualifications

Discipline requiring a Master's Degree:	<ul style="list-style-type: none"> Engineering Technology
Disciplines in which a Master's Degree is not usually available:	<ul style="list-style-type: none"> Welding
Disciplines in which a Master's Degree is not generally available BUT which requires a specific Bachelor's or Associate Degree:	No value

Course Development Options

Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Rationale For Credit By Exam/Challenge

No value

In-Service Course (required by California Penal Code)

Course Special Class Status (CB13)

Course is not a special class.

Allowed Number of Retakes

99

Retake Policy Description

This is a noncredit course. Student can re-enroll as many times as necessary to achieve satisfactory progress.

Course Support Course Status (CB26)

Course is not a support course

Grade Options

- Noncredit Grading (P/SP/NP, UG)

Course Prior To College Level (CB21)

Not applicable.

Allow Students To Audit Course

Associated Programs

Course is part of a program (CB24)

Associated Program

Award Type

Active

Introduction to Welding Processes Certificate of Completion (NC) (In Development)

Certificate of Completion (NC)

Summer 2022

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

Y

Transferability

Not transferable

Transferability Status

Not transferable

Units and Hours: Non-Credit

Summary

Minimum Credit Units (CB07) 0

Maximum Credit Units (CB06) 0

Total Course In-Class (Contact) Hours 54

Total Course Out-of-Class Hours 54

Total Student Learning Hours 108

Credit / Non-Credit Options

Course Credit Status (CB04)

Non-Credit

Course Non Credit Category (CB22)

Workforce Preparation.

Non-Credit Characteristic

Learning Assistance

Course Classification Code (CB11)

Other Non-Credit Enhanced Funding.

Funding Agency Category (CB23)

This course was primarily developed using Economic Development funds.

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1.5	3
Laboratory Hours	1.5	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	27
Laboratory	27
Activity	0
Total	54
Course Out-of-Class Hours	
Lecture	54
Laboratory	0
Activity	0
Total	54

Units and Hours: Non-Credit - 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

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction

Lecture

Rationale

No value

Methods of Instruction

Study

Rationale

No value

Methods of Instruction

Lecture / Discussion

Rationale

No value

Methods of Instruction

Class Activities

Rationale

No value

Methods of Instruction

Laboratory

Rationale

No value

Methods of Instruction

Discussion

Rationale

No value

Methods of Instruction

Demonstration

Rationale

No value

Methods of Instruction

Project Based Learning

Rationale

Consumable welding project completed in class

Assignments

Consumable welding project completed in class

Methods of Evaluation

Rationale

1. This course is degree applicable, substantial writing assignments are inappropriate because this course involves skill demonstrations or problem solving. 2. Computational or non-computational problem-solving demonstrations include: A. Exams B. Homework problems C. Quizzes 3. Skill demonstrations include: A. Class performance B. Performance exams 4. Objective exams include: A. Multiple choice B. Matching items C. Safety exams D. True/false

Homework	No value
Performance Exams	No value
Skills Demonstration (in class)	No value
Written Exams (Quizzes, Midterm, and/or Final Examination)	No value
Cumulative Final Examination	No value

Equipment

Without Equipment.

Textbooks

Author	Title	Publisher	Date	ISBN
No Value	No Value	No Value	No Value	No Value

Other Instructional Materials

Description	Jeffus, Larry. Welding and its Applications. Cengage, 2021 ISBN 9780357377789
Author	Jeffus, Larry
Citation	ISBN 9780357377789

Materials Fee

Will submit documents to the BOT

Learning Outcomes and Objectives

Course Objectives

1. The student will understand how welding is used in industry and how it affects our economy.

2. Students will understand the concept of safety, correct tool usage, and practice it.

3. Students will understand the use of SMAW equipment and explain how it is used.

4. Students will understand the various filler materials used in SMAW.

5. Students will understand the most commonly used weld joint designs.

6. Students will understand different methods of testing welds.

7. Students will understand basic electrical terms: amperage, volts, resistance, polarity, and ground as it relates to welding.

8. Students will understand when a welder is certified to a welding procedure.

9. Students will understand the relationship of codes to the welds being made.

10. Students will understand how to properly prepare and setup a 3G & 4G test.

CSLOs

1. Upon successful completion of the course, the student will be able to demonstrate an understanding through the application of safety concepts as they are related to welding equipment, cutting equipment, shop equipment, and hand tools. Expected SLO Performance: 70.0

2. Upon successful completion of the course, the student will be able to examine, recognize and demonstrate the application of welding equipment, filler metals, and apply this process to commonly used weld joints. Expected SLO Performance: 70.0

3. Upon successful completion of the course, the student will be able to locate, manipulate, and solve math problems that pertain to welding projects based on the U.S. customary inch. Expected SLO Performance: 70.0

4. Upon successful completion of the course, the student will be able to employ acquired skills to identify, illustrate, and apply knowledge of weld joint configurations, discontinuities, and defects and their application to welding codes. Expected SLO Performance: 70.0

Outline

Course Outline

DETAILED TOPICAL OUTLINE:
A. Unit 1 SMAW – Introduction

1. The development of arc welding equipment
 2. The development of the shielded metal arc electrodes
 3. Arc Welding accessories
 1. electrode holders
 2. welding hoods
 3. welding lenses
 4. cables
- B. Unit 2 SMAW – SAFETY
1. Electrical Shock
 1. grounded machine and work piece
 2. electricity and water
 2. Burns, Ultra violet and infrared rays
 1. proper clothing - leathers, gloves
 2. protect all exposed skin
 3. quenching metal - steam
 4. correct eye protection
 3. Toxic related to welding
 1. Smoke and fumes from welding on:
 - a. galvanize
 - b. lead
 - c. brass
 - d. stainless steel
 2. Proper Ventilation
 - a. positioning weldments under ventilation hood
 - b. adequate fresh air supply
 - c. welding in tanks and other containers
 4. Handling and preparing metal
 1. Shearing
 2. Grinding
 - a. pedestal grinder
 - b. hand held grinders
 3. Wire wheel
 4. Carrying long lengths of steel
 5. Lifting heavy objects
- C. Unit 3 Striking the Arc
1. Tapping, scratching methods
 2. Arc Length
 3. Correct angle of electrode
 4. Direction of Travel
- D. Unit 4 Electrical Terms
1. Amperage, volts, OCV
 2. Resistance
 3. Conductors
 4. Polarity
- E. Unit 5 Joint Design
1. Discussion on weld joint design
 1. penetration qualities
 2. arc stability
 3. deposition rates
 4. tensile strength
 2. The nature of Flux for the coated Electrode
 1. primary constituents, chemistry
 2. effects of flux coating on weld quality
- F. Unit 6 SMAW – Weld Exercise
1. Adjusting the SMAW machines
 2. Practice welding on various joints
 1. lap, tee and butt joints
 3. Welding with E-7018 in various positions
- G. Unit 7 SMAW Consumable
1. AWS classification system
 2. Electrode series e.g. low hydrogen, iron powder, etc.
 3. Electrode characteristics
 1. penetration qualities
 2. arc stability
 3. deposition rates
 4. tensile strength
 4. The nature of Flux for the coated Electrode

1. primary constituents, chemistry
2. effects of flux coating on weld quality

H. Unit 8 Power Sources

1. Constant Current
2. Constant Potential

I. Unit 9 SMAW – Weld Exercises

1. Adjusting the SMAW machines
2. Practice welding on various joints
 1. lap, tee, edge and butt joints
3. Welding with E-7018, in various positions

J. Unit 10 Final & Clean-up

Lab Outline

Lab:

Unit 2 SMAW – SAFETY (4 hours)

- Electrical Shock
 1. grounded machine and work piece
 2. electricity and water
- Burns, Ultra violet and infrared rays
 1. proper clothing - leathers, gloves
 2. protect all exposed skin
 3. quenching metal - steam
 4. correct eye protection
- Toxic related to welding
 1. Smoke and fumes from welding on:
 - a. galvanize
 - b. lead
 - c. brass
 - d. stainless steel
 2. Proper Ventilation
 - a. positioning weldments under ventilation hood
 - b. adequate fresh air supply
 - c. welding in tanks and other containers
- Handling and preparing metal
 1. Shearing
 2. Grinding
 - a. pedestal grinder
 - b. hand held grinders
 3. Wire wheel
 4. Carrying long lengths of steel
 5. Lifting heavy objects

Unit 3 Striking the Arc (3 hours)

- Tapping, scratching methods
- Arc Length
- Correct angle of electrode
- Direction of Travel

Unit 4 Electrical Terms (3 hours)

- Amperage, volts, OCV
- Resistance
- Conductors
- Polarity

Unit 5 Joint Design (3 hours)

- Discussion on weld joint design
 1. penetration qualities
 2. arc stability
 3. deposition rates
 4. tensile strength
- The nature of Flux for the coated Electrode
 1. primary constituents, chemistry
 2. effects of flux coating on weld quality

Unit 6 SMAW – Weld Exercise (3 hours)

- Adjusting the SMAW machines

- Practice welding on various joints
 1. lap, tee and butt joints
- Welding with E-7018 in various positions

Unit 7 SMAW Consumable (3 hours)

- AWS classification system
- Electrode series e.g. low hydrogen, iron powder, etc.
- Electrode characteristics
 1. penetration qualities
 2. arc stability
 3. deposition rates
 4. tensile strength
- The nature of Flux for the coated Electrode
 1. primary constituents, chemistry
 2. effects of flux coating on weld quality

Unit 8 Power Sources (3 hours)

- Constant Current
- Constant Potential

Unit 9 SMAW – Weld Exercises (3 hours)

- Adjusting the SMAW machines
- Practice welding on various joints
 1. lap, tee, edge and butt joints
- Welding with E-7018, in various positions

Unit 10 Final Review & Clean-up (2 hours)**Distance Education Criteria and Standards_3.1**

Please choose all of the delivery methods applicable to this course.

- Face to Face
- Hybrid (requires face to face meetings)
- Online (Flexible, purely online no face to face contact)

Rigor statement: The same standards of course quality shall be applied to distance education as are applied to traditional classroom courses in regard to the course quality judgments made pursuant to the requirements of Section 55002. The same expectations applies to any local course quality determination or review process.

- Methods of evaluation and out of class assignments are the same as for a face to face course.

If the methods of evaluation differ from a face to face courses, please indicate what the differences are and why they are being used.

No Value

If the face to face course has a lab, field trip, or site visit explain how these components will be performed in the online course. Be sure to identify how the lab component will differ from a homework assignment.

No Value

All approved courses offered as distance education shall include regular, effective contact between instructor and students. Effective methods are expected to be utilized by all instructors teaching the course but are not limited to the choices below. Choose the methods demonstrating effective INSTRUCTOR/STUDENT contact for this course. (Choose all that apply)

- Email and other online Messaging
- Face to face meetings (group or individual)
- Interactive Video

- Library Workshop
- Archived Video/ Lecture Recordings

All approved courses offered as distance education shall include regular, effective contact between instructor and students. Effective methods are expected to be utilized by all instructors teaching the course but are not limited to the choices below. Choose the methods demonstrating effective STUDENT/STUDENT contact for this course. (Choose all that apply)

No Value

All approved courses offered as distance education shall include regular, effective contact between instructor and students. Effective methods are expected to be utilized by all instructors teaching the course but are not limited to the choices below. Choose the methods demonstrating effective STUDENT/CONTENT contact for this course. (Choose all that apply)

No Value

Purely because of the delivery mode, will you require additional software or hardware beyond basic computer and web browser capabilities?

No

Federal and state regulations require that all online course materials be made available in an accessible electronic format. By checking both boxes below, the instructor is ensuring compliance with Section 508 of the Rehabilitation Act.

- Instructor will ensure the course is 508 compliant using the Course Management System and other tools as needed.
- Instructor will ensure textbook and any other courses materials are 508 compliant.

A good practice is that section size should be no greater in distance education modes than in regular face to face versions of the course. Will the online section for this course differ from face to face sections?

- No

If the online section of the course will differ in size from face to face sections, please provide a rationale for the size difference.

No Value

Provide supplemental information for all OTHER options chosen in the sections above.

No Value