

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

WELDB53BN : Shielded Metal Arc Welding 2

General Information

Author:	<ul style="list-style-type: none"> Klint Rigby
Attachments:	WELD B53BNC.docx WELD B53BNC Critical Thinking Assignment.docx WELD B53BNC AssessmentMappingForm.docx
Course Code (CB01) :	WELDB53BN
Course Title (CB02) :	Shielded Metal Arc Welding 2
Department:	Welding
Proposal Start:	Spring 2022
TOP Code (CB03) :	(0956.50) Welding Technology
CIP Code:	(48.0508) Welding Technology/Welder
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000625329
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 online designation to be eligible for online/hybrid education
Author:	No value

Minimum Qualifications

Discipline requiring a Master's Degree:	<ul style="list-style-type: none"> No Master's Degree required
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

Shielded Metal Arc Welding Certificate of Completion (NC) (In Development)

Certificate of Completion (NC)

Fall 2021

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	0
Total Student Learning Hours	54

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) Workforce Preparation Enhanced Funding. <input type="checkbox"/> Variable Credit Course	Funding Agency Category (CB23) This course was primarily developed using Economic Development funds.	<input type="checkbox"/> Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

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

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 Rationale.

Methods of Instruction	Other
Rationale	Outside reading.

Methods of Instruction	Demonstration
Rationale	No Rationale.

Methods of Instruction	Skills Demonstrations
Rationale	No value

Methods of Instruction	Skills Development and Performance
Rationale	No value

Methods of Instruction	Project Based Learning
Rationale	No value

Assignments

Students will complete chapter readings from class textbook, and assigned review questions from each chapter. Additionally, students will be asked to complete assignments from the CD that accompanies the course textbook.

Methods of Evaluation	Rationale
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
Skills Checklists	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, 9th ed. Cengage 2021 ISBN 9780357377789
Author	Jeffus, Larry
Citation	ISBN 9780357377789

Materials Fee

Will submit forms to the BOT

Learning Outcomes and Objectives**Course Objectives**

1. Recognize the types of welding required in various industries and applications.
2. Recognize and practice safe work procedures in the welding environment.
3. Identify tools and equipment used in arc welding.
4. Configure the welding environment for various weld specifications.
5. Understand and adjust the welding equipment as required for polarity, amperage, and position.

6. Recognize defects in welds and make corrections to setup or technique to correct and prevent defects.

CSLOs

1. Upon successful completion of the course, the student will be able to demonstrate an advanced understanding of welding in industry and how it affects our economy. Expected SLO Performance: 70.0
2. Upon successful completion of the course, the student will be able to demonstrate lab safety and correct tool usage. Expected SLO Performance: 70.0
3. Upon successful completion of the course, the student will be able to demonstrate the use of constant current equipment and explain how it is used. Expected SLO Performance: 70.0
4. Upon successful completion of the course, the student will be able to differentiate between the various quick fill electrodes used in SMAW. Expected SLO Performance: 70.0
5. Upon successful completion of the course, the student will be able to illustrate lap joints and Tee joints. Expected SLO Performance: 70.0
6. Upon successful completion of the course, the student will be able to demonstrate an understanding of the difference between a weld defect and discontinuities. Expected SLO Performance: 70.0

Outline

Course Outline

Lecture:

Unit 1 SMAW – Introduction (3 hours)

- The development of arc welding equipment
- The development of the shielded metal arc electrodes
- Arc Welding accessories
 1. electrode holders
 2. welding hoods
 3. welding lenses
 4. cables

Unit 2 SMAW – SAFETY (3 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 (2 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 (1 hour)**Lab Outline**

Lab:

Unit 2 SMAW – SAFETY (3 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
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 - c. welding in tanks and other containers
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 4. Carrying long lengths of steel
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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
- Other Activities

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