

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

## WELDB1BNC : Introduction to the Welding Processes

### General Information

Author:	• Klint Rigby
Attachments:	WELD B1BNC.docx WELD B1BNC AssessmentMappingForm.docx
Course Code (CB01) :	WELDB1BNC
Course Title (CB02) :	Introduction to the Welding Processes
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) :	CCC000625327
Curriculum Committee Approval Date:	06/03/2021
Board of Trustees Approval Date:	07/08/2021
External Review Approval Date:	07/01/2022
Course Description:	Properties and characteristics of metals and a survey of metal welding processes. Safety, theory, and practical experience in shielded metal arc, PAC, MIG, TIG, FCAW, Shear & Brake, joint design, codes and weld testing.
Submission Rationale:	Add Distance Education  Course must be revised in order to be offered with online component for online/hybrid modality
Author:	No value

### Minimum Qualifications

Discipline requiring a Master's Degree:	• Engineering Technology
Disciplines in which a Master's Degree is not usually available:	• Welding
Disciplines in which a Master's Degree is not generally available BUT which requires a specific Bachelor's or Associate Degree:	• Welding

### Course Development Options

Basic Skill Status (CB08)	Course Special Class Status (CB13)	Grade Options
Course is not a basic skills course.	Course is not a special class.	• Noncredit Grading (P/SP/NP, UG)

<input checked="" type="checkbox"/> Allow Students to Gain Credit by Exam/Challenge	<b>Allowed Number of Retakes</b> 99	<b>Course Prior To College Level (CB21)</b> Not applicable.
<b>Rationale For Credit By Exam/Challenge</b> No value	<b>Retake Policy Description</b> This is a noncredit course. Student can re-enroll as many times as necessary to achieve satisfactory progress.	<input checked="" type="checkbox"/> Allow Students To Audit Course
<input type="checkbox"/> In-Service Course (required by California Penal Code)	<b>Course Support Course Status (CB26)</b> Course is not a support course	

Associated Programs		
<input checked="" type="checkbox"/> 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	
<b>Course General Education Status (CB25)</b> Y	
<b>Transferability</b> Not transferable	<b>Transferability Status</b> Not transferable

Units and Hours: Non-Credit	
<b>Summary</b>	
<b>Minimum Credit Units (CB07)</b>	0
<b>Maximum Credit Units (CB06)</b>	0
<b>Total Course In-Class (Contact) Hours</b>	54
<b>Total Course Out-of-Class Hours</b>	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**

No Value

**Course Classification Code (CB11)**

Non-Enhanced Funding.

Variable Credit Course

**Funding Agency Category (CB23)**

Not Applicable.

Cooperative Work Experience Education Status (CB10)

**Weekly Student Hours**

	In Class	Out of Class
Lecture Hours	27	0
Laboratory Hours	27	0
Activity Hours	0	0

**Course Student Hours**

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

**Units and Hours: Profile Name**

**Summary**

<b>Minimum Credit Units (CB07)</b>	0
<b>Maximum Credit Units (CB06)</b>	0
<b>Total Course In-Class (Contact) Hours</b>	0
<b>Total Course Out-of-Class Hours</b>	0

**Total Student Learning Hours**      0  
**Faculty Load**                              0

**Detail**

**Weekly Student Hours**

	<b>In Class</b>	<b>Out of Class</b>
Lecture Hours	0	0
Laboratory Hours	0	0
Activity Hours	0	0

**Course Student Hours**

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

**Time Commitment Notes for Students**

No Value

**Faculty Load**

**Extra Duties:** 0

**Faculty Load:** 0

**Units and Hours: Profile Name - Weekly Specialty Hours**

<b>Activity Name</b>	<b>Type</b>	<b>In Class</b>	<b>Out of Class</b>
No Value	No Value	No Value	No Value

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

No Value

<b>Limitations on Enrollment</b>	
<b>Limitations on Enrollment</b>	<b>Description</b>
No value	No value

<b>Specifications</b>	
<b>Methods of Instruction</b>	
Methods of Instruction	Lecture
Rationale	No Rationale
<b>Methods of Instruction</b>	
Methods of Instruction	Other
Rationale	Outside reading
<b>Methods of Instruction</b>	
Methods of Instruction	Other
Rationale	Written work
<b>Methods of Instruction</b>	
Methods of Instruction	Other
Rationale	Other Methods: Instructional Activities: 1. Lecture/discussion A. PowerPoint B. Whiteboard C. Videos 2. Study 3. Required reading 4. Written work (reports & essay) 5. Guest speaker 6. Test(s) & quizzes
<b>Methods of Instruction</b>	
Methods of Instruction	Demonstration
Rationale	No Rationale.
<b>Methods of Instruction</b>	
Methods of Instruction	Discussion

<b>Rationale</b>	No Rationale.			
<b>Methods of Instruction</b>	Laboratory			
<b>Rationale</b>	No Rationale.			
<b>Methods of Instruction</b>	Other			
<b>Rationale</b>	Audiovisual			
<b>Assignments</b>				
<p><b>Reading in Text.</b>  <b>Chapter review questions.</b>  <b>These activities require 2 hours of work for every hour of lecture.</b></p>				
<b>Methods of Evaluation</b>	<b>Rationale</b>			
Homework	This course is degree applicable, substantial writing assignments are inappropriate because this course involves skill demonstrations or problem solving.			
Performance Exams	Objective exams include: A. Multiple choice B. Matching items C. Safety exams D. True/false			
Skills Demonstration (in class)	Skill demonstrations include: A. Class performance B. Performance exams			
Computational Problem-Solving Demonstrations	Computational or non-computational problem-solving demonstrations include: A. Exams B. Homework problems C. Quizzes			
<b>Equipment</b>				
Without Equipment.				
<b>Textbooks</b>				
<b>Author</b>	<b>Title</b>	<b>Publisher</b>	<b>Date</b>	<b>ISBN</b>
No Value	No Value	No Value	No Value	No Value
<b>Other Instructional Materials</b>				
No Value				
<b>Materials Fee</b>				

No value

## Learning Outcomes and Objectives

### Course Objectives

1. Students will demonstrate an understanding of safety in welding and the hazards in the welding lab.
2. Students will demonstrate safe setup of SMAW, GMAW, FCAW, GTAW, PAC, & Fabrication equipment.
3. Students will have an understanding of the importance of math and be able to solve problems as they pertain to welding projects.
4. Students will recognize and diagnose basic weld configurations, discontinuities, and how they pertain to welding codes.

### CSLOs

1. Upon successful completion of the course, the student will be able to evaluate common shop and personal safety hazards in the work place.  
Expected SLO Performance: 70.0
2. Upon successful completion of the course, the student will be able to setup the proper welding equipment for welding.  
Expected SLO Performance: 70.0
3. Upon successful completion of the course, the student will be able to locate, manipulate, and solve welding math problems.  
Expected SLO Performance: 70.0
4. Upon successful completion of the course, the student will be able to evaluate weld joint configurations, discontinuities, and defects.  
Expected SLO Performance: 70.0

## Outline

### Course Outline

Lecture:  
 WEEK 1 Syllabus & Introduction (5hrs.)  
 Equipment Safety  
 Fire Hazards  
 Welding Gloves  
 Welding Hoods  
 PPE  
 Grinder Safety  
 7" Grinders  
 4" Grinders  
 Wire Wheel  
 Grinding Disks  
 In-line Grinders  
 24.  
 Ear Safety  
 Eye Safety

## WEEK 2 SMAW (3 hrs.)

Equipment Set-up  
Power Source  
Welding Leads  
Electrode Holder  
Ground Clamp  
Lead Size  
Electrodes  
Size  
Polarity  
Flux Covering  
Lap Joint  
Fillet Weld  
Toes  
Legs  
Face  
Discontinuities

## WEEK 3 Brake &amp; Shear (3 hrs.)

Trade Math  
Convert Decimals to Fractions  
Convert Fraction to Decimals  
Reducing Fractions  
Discuss BD & Shear Size  
Determine Shear Size  
Determine Single Line Dimensioning  
Bank Corner  
Datum Side  
Bend Deduction Chart  
Discuss BD & Shear Size  
Finish Shear exercise #1-#2  
Demonstrate Shear & Brake  
Turn in Shear Exercise 1, 2, &3.

## WEEK 4 GMAW – Mild Steel (3 hrs.)

Equipment Set-up  
Power Source  
Welding Leads  
Electrode Holder  
Ground Clamp  
Liner  
Electrodes (Wire)  
Size  
Polarity  
Gasses  
Tee Joint  
Fillet Weld  
Toes  
Legs  
Face  
Discontinuities

## WEEK 5 FCAW – Mild Steel (3 hrs.)

Equipment Set-up  
Power Source  
Welding Leads  
Fillet Weld  
Toes  
Legs  
Face  
Discontinuities  
Inner Shield  
Fluxes  
Polarity

## WEEK 6 GTAW – Mild Steel (3 hrs.)

Equipment Set-up  
Power Source  
Welding Leads  
Electrode Holder  
Ground Clamp



Liner  
 Electrodes (Wire)  
 Size  
 Polarity  
 Gasses  
 Tee Joint  
 Fillet Weld  
 Toes  
 Legs  
 Legs  
 Face  
 Discontinuities  
 WEEK 7 GTAW – Aluminum (4 hrs.)  
 WEEK 8 FINISH ALL PROJECTS (3 hrs.)  
 Equipment  
 Gasses  
 Leads  
 Discontinuities  
 Porosity  
 Under Fill  
 Over Fill  
 Under Cut  
 Cold Lap

## Lab Outline

Lab:

NOTE: Every Topic in Lecture is applied in the lab.

Note: This class is delivered in a 16 week & 8 week format. This Topical Outline represents an 8 week format.

Note Weld B1B has a total of 27 hours of Lab.

WEEK 1 Walkthrough & Orientation (4 hrs.)

- Safety
- Lab Introduction
- Intro. To VRTEX 360
- Lab Safety and Cleanup
- PPE

WEEK 2 Break & Shear Application (4 hrs.)

- Shear Safety
- Grinder Safety
- Exercise #1
- Finger & Pan Brake Safety
- Exercise #2
- Exercise #3

WEEK 3 SMAW (4 hrs.)

- Equipment Setup
- Electrode Selection & Settings
- SMAW Lap Weld
- Lap Weld – Multi Pass
- Tee Joint
- Tee Joint – Multi Pass

WEEK 4 GMAW – Mild Steel (3 hrs.)

- Equipment Setup
- Electrode Selection & Settings
- GMAW Lap Weld
- Lap Weld – Multi Pass
- Tee Joint • Tee Joint – Multi Pass

WEEK 5 FCAW – Mild Steel (3 hrs.)

- Equipment Setup
- Electrode Selection & Settings
- FCAW Lap Weld
- Lap Weld – Multi Pass
- Tee Joint
- Tee Joint – Multi Pass

WEEK 6 GTAW – Mild Steel (3 hrs.)

- Equipment Setup

- Electrode Selection & Settings
  - GTAW Lap Weld
  - Lap Weld – Multi Pass
  - Tee Joint
  - Tee Joint – Multi Pass
- WEEK 7 GTAW – Aluminum (3 hrs.)
- Equipment Setup
  - Electrode Selection & Settings
  - GTAW Lap Weld
  - Lap Weld – Multi Pass
  - Tee Joint
  - Tee Joint – Multi Pass
- WEEK 8 FINISH ALL PROJECTS & CLEANUP (3 hrs.)
- PAC - Equipment Setup
  - Layout and cutting
  - PPE

### 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
- 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)

- Email and other online messaging
- Interactive Video
- Message Board
- Archived Video / Recorded Lectures

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