WELD-101: WELDING THEORY & PRACTICE 2

Effective Term
Fall 2026

CC Approval
11/07/2025

AS Approval
11/13/2025

BOT Approval
11/20/2025

COCI Approval
03/05/2026

SECTION A - Course Data Elements

CB04 Credit Status
Credit - Degree Applicable

Discipline

Minimum Qualifications	And/Or
Welding (Any Degree and Professional Experience)	

Subject Code
WELD - Welding Technology
Course Number
101

Department
Welding Technology

Division
Career Education and Workforce Development (CEWD)

Full Course Title
Welding Theory & Practice 2

Short Title
Welding Theory & Practice 2

CB03 TOP Code
0956.50 - *Welding Technology

CIP Code
48.0508

CB08 Basic Skills Status
NBS - Not Basic Skills

CB09 SAM Code
D - Possibly Occupational

Rationale
The SLOs were revised to streamline outcomes, eliminate redundancy, and ensure alignment with current industry standards and measurable skills for student success.

SECTION B - Course Description

Catalog Course Description

The second of a two-semester welding course designed to fit the needs of students in other vocational areas and upgrade welders already in the industry. This welding course is designed to upgrade and develop manipulative skills, technical knowledge and an appreciation of welding.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit

No

Repeatability

Not Repeatable

Grading Options

Letter Grade or Pass/No Pass

Allow Audit

Yes

Requisites

Prerequisite(s)

Completion of WELD-100 or WELD-120 with a minimum grade of C.

Requisite Justification

Requisite Description

Course Not in a Sequence

Subject

WELD

Course #

120

Level of Scrutiny

Content Review

Upon entering this course, students should be able to:

Student will demonstrate fundamental knowledge and ability to work safely with electric arc welding equipment; oxyacetylene equipment and welding shop tools.

Welding 100 or 120 or 130.These courses contain a comprehensive Safety lecture component of the welding program. The student is required to pass a written Safety test with 90% accuracy before entering the welding shop.

The student is required to handle gases which are highly explosive and flammable. In addition, they will be dealing with electrical currents, grinding equipment, fire hazards, and high-pressure inert and non-flammable gases. Without proper Safety Training the student would present a very real danger to themselves, fellow students and faculty. The Safety Training required to enter the welding program is identical to the skills needed to function safely in the welding industry and is highly supported by employers and advisory committee members.

Requisite Description

Course Not in a Sequence

Subject

WELD

Course #

130

Level of Scrutiny
Content Review

Upon entering this course, students should be able to:
Student will demonstrate fundamental knowledge and ability to work safely with electric arc welding equipment; oxyacetylene equipment and welding shop tools.

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Requisite Description
Course in a Sequence

Subject
WELD
Course #
100

Level of Scrutiny
Content Review

Upon entering this course, students should be able to:
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SECTION D - Course Standards

Is this course variable unit?
No

Units
3.00

Lecture Hours
36.00

Lab Hours
54.00

Outside of Class Hours
72

Total Contact Hours
90

Total Student Hours
162

Distance Education Approval

Is this course offered through Distance Education?
Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Hybrid	Permanent

SECTION E - Course Content

Student Learning Outcomes

	Upon satisfactory completion of the course, students will be able to:
1.	Demonstrate intermediate welding techniques in SMAW and GMAW (1G–2G, fillet and groove welds).
2.	Prepare and cut metals using oxy-fuel and plasma cutting equipment safely.
3.	Identify and work with basic ferrous and non-ferrous materials.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1.	Demonstrate and practice good safety and personal work habits. Use the tools, machines and equipment of welding in a professional manner.
2.	Exhibit knowledge of the nomenclature of electrodes, gases and other supplies of welding.
3.	Demonstrate knowledge of procedures, processes and techniques of welding.
4.	Perform basic skills in arc welding and oxygen-fuel gas cutting.
5.	Exhibit basic knowledge of welding materials, symbols and layout.

Course Content

1. Orientation
   a. The Classroom, shop area and its machines and tools
   b. General shop rules
   c. Personal conduct – attitudes and responsibilities
   d. Testing and grading
2. Safety
   a. Personal safety and habits
   b. Shop safety rules
   c. Oxyacetylene safety
   d. Arc welding safety
   e. Safety devices – fire extinguishers, fire blankets, etc.
   f. General safety – grinders, hand tools, electrical, etc.
   g. Safety test
3. Oxygen Fuel Gas Cutting
   a. Safety
   b. Manual oxygen-fuel gas
   c. Cutting torches (types)
   d. Oxygen-fuel gas flames, temperatures of each, etc.
   e. Machine oxygen-fuel gas cutting
   f. Cutting nozzles, tips, and gas pressures
4. Electrical Arc Welding with Stick Electrodes
   a. Safety
   b. Machines and equipment
   c. Polarity – straight and reverse
   d. Nomenclature of electrodes and coatings
   e. Preparations of metals for welding

f. Starting and setting machines – voltage and amperage
g. Striking and maintaining the arc
h. Running the basic welds
i. Flat, horizontal, vertical and overhead welding with various electrodes
j. Terminology, processes, procedures and techniques

5. Materials
   a. Ferrous materials
   b. Non-ferrous materials
   c. Properties of metals
   d. Carbon steels; alloy steels
6. Preparing and Finishing Materials
   a. Safety
   b. Layout and fitting
   c. Cleaning Materials
   d. Handling materials
   e. Edge preparations for welding
   f. Clean-up and painting

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Lecture	Intermediate welding procedures and cutting techniques using trade-based examples.
Observation and Demonstration	Instructor-supervised practice applying SMAW/GMAW in groove and fillet welds.

Online Adaptation

Types	Examples of learning activities
Lecture	Asynchronous lessons on welding metallurgy, base metal prep, and joint fit-up.
Lab	Recorded lab demonstrations for oxy-fuel and plasma cutting.

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
E-mail Communication
Telephone Conversations
Video or Teleconferencing

Student-Initiated Online Contact Types

Discussions

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Exams/Tests	Students will be given written weekly tests covering assigned reading and weekly lectures. Example: Tests comprised of multiple choice and T/F questions. Students will be given a mid-term and final examination. Example: Tests comprised of multiple choice, identification, short answer and T/F questions.
Lab Activities	Students will complete weekly lab assignments. Example: Place a bevel groove weld with a backing bar using E7018 electrode in the vertical position.

Assignments

Reading Assignments
1. Students will be required to read selections from their textbook in order to understand essential concepts.
Example: section on Gas Metal Arc Welding (GMAW), Learn to Weld, textbook.
2. Students will be required to read selections from their textbook and lecture notes in order to perform lab exercises.
Example: produce a fillet weld on a T joint with an ER70S-6 electrode in the vertical position.

Writing Assignments
1. Students will be required to write-up lab assignments.
Example: List three reasons that GMAW is used.
2. Students will be required to formulate corrective actions while welding.
Example: correctly adjusting machine settings to achieve the proper voltage/amperage relationship.
3. Students will interpret welds to formulate corrective action.
Example: determine possible changes in setting parameters and/or technique to avoid undercut.

SECTION F - Textbooks and Instructional Materials

Material Type
Textbook

Author
Bridgium

Title
How to Weld

Edition/Version
1st

Publisher
Motorbooks

Year
2008

Rationale
no updated version

ISBN #
978-0760331743

SECTION G - Diversity, Equity and Inclusivity

How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?
This course fosters an inclusive learning environment by integrating visual, auditory, and hands-on instruction. Scaffolded assignments and flexible lab pacing support students with varied experience levels. Real-world applications are drawn from diverse trades and industries to enhance relevance and engagement.

Course Codes (Admin Only)

CB00 State ID
CCC000188813

CB10 Cooperative Work Experience Status
N - Is Not Part of a Cooperative Work Experience Education Program

CB11 Course Classification Status
Y - Credit Course

CB13 Special Class Status
N - The Course is Not an Approved Special Class

CB23 Funding Agency Category
Y - Not Applicable (Funding Not Used)

CB24 Program Course Status
Program Applicable

Allow Pass/No Pass
Yes

Only Pass/No Pass
No