

WELD-121: WELDING TECHNOLOGY 2

Effective Term

Fall 2026

CC Approval

10/03/2025

AS Approval

10/09/2025

BOT Approval

10/16/2025

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

121

Department

Welding Technology

Division

Career Education and Workforce Development (CEWD)

Full Course Title

Welding Technology 2

Short Title

Welding Technology 2

CB03 TOP Code

0956.50 - *Welding Technology

CIP Code

48.0508

CB08 Basic Skills Status

NBS - Not Basic Skills

CB09 SAM Code

C - Clearly 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 semester of Welding Technology advances into Gas Tungsten Arc Welding, SMAW electrode selection and the semi-automatic processes of hardwire and Flux core. Concepts and skills are developed with TIG, stick electrodes, core wire and Inner shield in the vertical and overhead positions. Materials, preparation of joints and their design and related subjects will be covered.

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)

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

Requisite Justification

Requisite Description

Course 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.

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 #

100

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.

SECTION D - Course Standards**Is this course variable unit?**

No

Units

7.00

Lecture Hours

54

Lab Hours

216

Outside of Class Hours

108

Total Contact Hours

270

Total Student Hours

378

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.	Perform GTAW, GMAW, and FCAW welds on carbon steel and stainless steel in multiple positions.
2.	Interpret basic welding symbols and blueprints to complete welds.
3.	Troubleshoot welding defects and adjust parameters accordingly.
4.	Apply safety and shop organization procedures in a shared advanced welding environment.

Course Objectives

Upon satisfactory completion of the course, students will be able to:	
1.	Use the tools, machines and equipment of welding in a safe, professional, efficient manner.
2.	Demonstrate improved ability to use and understand the nomenclature of electrodes, gases and other supplies used in the welding discipline.
3.	Demonstrate improved knowledge and ability in welding procedures, processes and techniques.
4.	Demonstrate a high degree of proficiency in setting up and using welding equipment for oxyacetylene, SMAW, GMAW and GTA.

Course Content

1. BLOCK 1 – Orientation 6 hours
 - a. Review of Safety Practices and Personal Conduct and Responsibilities
2. BLOCK 2 – Cutting Processes 15 hours
 - a. Safety
 - b. Manual Oxyacetylene, Machine Oxyacetylene and Other Gases
 - c. Electric Arc Cutting – Air Arc and Electrode Cutting
 - d. Cutting Nozzles and Gas Pressures
3. BLOCK 3 – Electric Arc Welding with Stick Electrodes 100 hours
 - a. Safety
 - b. Machines and Equipment;
 - c. Starting and Setting Machines (Voltage and Amperage)
 - d. Polarity – Straight and Reverse; Nomenclature of Electrodes and Coatings
 - e. Preparation of Metals for Welding
 - f. Striking and Maintaining the Arc; Running the Basic Beads
 - g. Flat, Vertical and Overhead Welding with Various Electrodes
4. BLOCK 4 – Gas Shielded Arc Welding (GMAW and GTAW) 104 hours
 - a. Safety
 - b. Machines and Equipment
 - c. Shielding Gases
 - d. Filler Metal; Preparation of Materials
 - e. Arc Transfer
 - f. Current: High Frequency, Constant Potential, Variable Potential
5. BLOCK 5 – Related Subjects 15 hours
 - a. Fundamentals of Blueprint Reading; Design of Welded Joints
 - b. Welding Symbols

- c. Related Mathematics and Fundamental English
- d. Laws and Codes
- 6. BLOCK 6 – Materials 15 hours
 - a. Ferrous Materials; Non-ferrous Materials
 - b. Carbon Steel – Alloy Steel; Cast Iron and Cast Steels; Stainless Steel
 - c. Properties of Metals; Kinds of Strength
 - d. Factors related to Properties
 - e. Identification of Metals
 - f. Material shapes, Weights and Uses
 - g. Use of Material Handbooks
- 7. PREPARING AND FINISHING MATERIALS
 - a. Layout and Fitting
 - b. Cleaning Materials; Handling Materials; Edge Preparation for Welding
 - c. Clean-Up and Painting

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Observation and Demonstration	Techniques in GTAW, GMAW, and FCAW across flat, horizontal, and vertical positions.
Lecture	Step-by-step group instruction using real-world samples.

Online Adaptation

Types	Examples of learning activities
Lecture	Recorded welding techniques with commentary and troubleshooting tips.
Journal	Student logs of welding settings and outcomes.
Discussion	Structured prompts to reinforce key theory concepts.

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	<p>Students will be given written weekly tests covering assigned reading and weekly lectures. Example: tests comprised of multiple choice and T/F questions.</p> <p>Students will be given a mid-term and final examination. Example: Tests comprised of multiple choice, identification, short answer and T/F questions.</p>
Lab Activities	<p>Students will complete weekly lab assignments. Example: place a weld on a V groove butt with an .045 E71T-1 electrode in the 1G position.</p>

Assignments

Reading Assignments

1. Students will be required to read selections from their textbook in order to understand essential concepts.
Example: section on Gas Tungsten Arc Welding, Althouse, textbook.
2. Students will be required to read selections from their textbook and lecture notes in order to perform lab exercises.
Example: place a fillet weld on a T plate with a 1/16th", 2% Ceriated electrode in the 1G position.

Writing Assignments

1. Students will be required to write-up lab assignments.
Example: List three corrective measures that may be taken to prevent or reduce burn through.
2. Students will be required to formulate corrective actions while welding. Example: correctly adjusting machine settings to achieve the proper bead profile.
3. Students will interpret welds to formulate corrective action.
Example: determine possible changes in setting parameters and/or technique to avoid undercut and cold lap.

Outside-of-Class Assignments

1. Each student shall research a topic of their choosing, complete a three-page report and give an oral presentation to the class.
2. Each student will design and fabricate a project utilizing a sketch or print, appropriate welding procedures perform a Visual Inspection and critique.

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author

Lincoln Electric

Title

Lincoln Electric Procedure Handbook of Arc Welding

Edition/Version

14h

Publisher

Lincoln Electric

Year

2003

Rationale

no updated version

ISBN

9990022968

Material Type

Textbook

Author

Lincoln Electric

Title

Metals and How to Weld Them

Edition/Version

2nd

Publisher

Lincoln Electric

Year

1990

Rationale

no updated version

Material Type

Textbook

Author

Althouse, Turnquist, Bowditch, Bowditch, & Bowditch

Title

Modern Welding

Edition/Version

10th

Publisher

Goodheart-Willcox

Year

2004

Material Type

Other required materials/supplies

Description

Safety glasses and gauntlet style welding gloves.

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 emphasizes individualized skill development through feedback loops, modeling, and flexible practice schedules. Students encounter a wide range of weld types and materials to reflect industry diversity. Inclusivity is promoted through visual aids, and collaborative skill stations.

Course Codes (Admin Only)**CB00 State ID**

CCC000265460

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