

Welding Technician Endorsement

Specifications, Competencies & Requirements

PURPOSE

This endorsement is meant for certified teachers interested in teaching **Welding** courses. It attaches to a current Utah Educator License with a license area of concentration in **Secondary** or **CTE Education**.

Upon attachment of this endorsement to a Utah educator license, educators will be approved to teach the following USBE courses:

Welding Technician, Entry
Welding Technician, Intermediate
Welding Technician, Advanced

ENDORSEMENT TYPES

Prerequisite

Demonstrate an understanding of Career and Technical Education (CTE) basics.
CTE Knowledge

Associate Level Requirements

Applicants must complete **TWO** of the following competency requirements. The associate level endorsement is valid for up to three school years before it expires. Associate-level endorsements are non-renewable.

Welding Processes
Project Fabrication
Automation
Lab Safety and Procedures

Professional Level Requirements

The applicant must meet **ALL** the competency areas listed above.

COMPETENCY DETAILS & DESCRIPTIONS

Prerequisite

1. CTE Knowledge

Demonstrate an understanding of CTE basics:

- Explain how CTE links learning to specific Utah industries and what its main goals are.
- Know the licenses and endorsements needed to teach specific CTE courses.
- Describe how CTE is organized into clusters and pathways at the state, district (LEA), and school levels, and how this helps students succeed after graduation.
- Locate and use the state's strands and standards in lesson plans.
- Explore CTE student organizations (CTSOs) and professional groups and explain how they support students and teachers.

- Explain how advisory boards, with industry members, make sure programs meet job market needs and maintain safe learning environments.
- Understand the basics of securing funding, planning for the future of the program, and participating in the state Program of Quality Review (PQR) to ensure program excellence.

Select **one** of the following options:

- **USBE Course:** [CTE Orientation](#)
- **Complete THREE years of full-time CTE Teaching in Utah**
- **Currently hold a professional-level CTE endorsement**

Endorsement Competencies

2. Welding Processes

Demonstrate basic understanding, terminology, and procedures for ALL the following:

1. Welding Processes

- Identify and describe common welding processes, including Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW/MIG), Gas Tungsten Arc Welding (GTAW/TIG), and Flux-Cored Arc Welding (FCAW).
- Understand the principles, equipment, and consumables used in each process.
- Select appropriate welding processes based on material type, thickness, and application.

2. Welding Joints, Types, and Positions

- Identify and describe standard weld joint types, including butt, lap, corner, edge, and tee joints.
- Understand welding positions (flat, horizontal, vertical, overhead) and their applications.
- Interpret welding symbols and blueprints to determine joint design and welding requirements.

4. Welding Inspection and Testing

- Understand visual inspection criteria for weld quality, including bead appearance, penetration, and defect identification.
- Describe non-destructive testing (NDT) methods, such as dye penetrant, ultrasonic, and radiographic testing.
- Recognize common weld defects (e.g., porosity, undercut, cracks) and understand their causes and corrective actions.

Select **one** of the following options:

- **A bachelor's degree or higher in Welding**
- **American Welding Society - [Certified Welding Instructor \(CWI\)](#)**
- **American Welding Society - [Certified Welding Educator \(CWE\)](#)**
- **College Course:** Transcripts showing a passing grade of a relevant course similar to (choose one):
 - BTech WELT 1030 - Welding Symbols & Print Reading
 - USU TEE 1640 - Introduction to Welding
 - USU ASTE 3030 - Metal Welding Processes and Technology in Agriculture

3. Project Fabrication

Demonstrate basic understanding, terminology, and procedures for ALL the following:

1. Planning and Fabricating Projects Using Blueprints

- Interpret technical drawings and blueprints to determine dimensions, materials, and fabrication steps.
- Plan fabrication sequences based on project specifications, tolerances, and available tools.
- Select appropriate tools, machines, and materials to complete fabrication tasks accurately and efficiently.

2. Developing Drawings, Creating Bills of Materials, and Preparing Materials for Fabrication

- Create or modify technical drawings using manual drafting or Computer-Aided Design (CAD) software.
- Generate a bill of materials (BOM) that includes quantities, specifications, and sourcing information.
- Measure, mark, and cut materials according to project requirements and safety standards.

3. Constructing Projects According to High-Quality Standards

- Assemble and fabricate components using precise measurements and industry-standard techniques.
- Inspect completed work for accuracy, structural integrity, and finish quality.
- Apply quality control procedures to ensure compliance with project specifications and safety regulations.

Select **one** of the following options:

- **A bachelor's or higher degree in Project Fabrication or Welding**
- **American Welding Society - [Certified Welding Instructor \(CWI\)](#)**
- **American Welding Society - [Certified Welding Educator \(CWE\)](#)**
- **College Course:** Transcripts showing a passing grade of a relevant course similar to (choose one):
 - BTech WELT 1030 - Welding Symbols & Print Reading

4. Automation

Demonstrate basic understanding, terminology, and procedures for ALL the following:

1. Using CNC Equipment for Plasma Cutting

- Operate CNC plasma cutting equipment safely and efficiently according to manufacturer specifications.
- Load and secure materials properly on the cutting table to ensure precision and safety.
- Execute programmed cutting operations to produce parts that meet dimensional and quality standards.
- Perform routine maintenance and troubleshooting on CNC plasma systems to ensure optimal performance.

2. Understanding and Applying CNC Processes

- Explain the principles of CNC (Computer Numerical Control) and how it is used in automated fabrication.
- Interpret G-code and CNC programming instructions for various machining and cutting operations.
- Set up and calibrate CNC machines, including tool selection, zeroing, and material alignment.
- Apply CNC processes to fabricate components with accuracy, repeatability, and efficiency.

Select **one** of the following options:

- A bachelor's or higher degree in Automation or Welding
- American Welding Society - [Certified Welding Instructor \(CWI\)](#)
- American Welding Society - [Certified Welding Educator \(CWE\)](#)
- **College Course:** Transcripts showing a passing grade of a relevant course similar to (choose one):
 - BTech WELT 1170 - Automated Cutting & Welding

5. Lab Safety and Procedures

Demonstrate basic understanding, terminology, and procedures for ALL the following:

1. Welding Program Knowledge

- Demonstrate understanding of the structure and purpose of secondary welding education programs within the CTE framework.
- Explain how welding education supports workforce development, industry certification, and career readiness.

2. Welding Standards and Industry Alignment

- Demonstrate familiarity with national and state welding standards (e.g., AWS, NCCER) and how they align with industry expectations.
- Understand how welding competencies connect to broader manufacturing and construction career pathways.

4. Welding Program Operations

- Understand the components of a comprehensive welding program, including equipment, facilities, consumables, and industry partnerships.
- Support the development and maintenance of welding labs, student projects, and school-based enterprises.

5. Laboratory and Facility Safety Management

- Maintain safe, functional, and well-organized welding labs and fabrication areas.
- Ensure proper storage, maintenance, and calibration of welding equipment and tools.

6. Safety and Risk Management in Welding Laboratories

- Develop and enforce safety protocols for welding environments, including PPE use, ventilation, and fire prevention.
- Identify and mitigate potential hazards related to welding processes, compressed gases, and electrical systems.
- Maintain safety documentation and ensure compliance with OSHA and industry safety standards.

7. Industry Integration and Technical Alignment

- Understand how welding education supports CTE goals and aligns with current labor market needs.
- Collaborate with industry partners to ensure program relevance and support student credentialing opportunities.

Select **one** of the following options:

- **Microcredential (Coming 2026)**
- **College Course:** Transcripts showing passing grade of a relevant course similar to (choose one):
 - ASTE 3240 - Teaching in Laboratory Settings