

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