

Mechanical Design Endorsement

Specifications, Competencies & Requirements

PURPOSE

This endorsement is meant for certified teachers interested in teaching **Mechanical Design** courses. It attaches to a current Utah Educator License with a license area of concentration in **Secondary** or **CTE** Education. Concurrent enrollment (CE) courses typically require teachers to have an earned bachelor's degree.

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

Mechanical Design & Engineering 1
Mechanical Design & Engineering 2
Mechanical Design & Engineering 3
CAM Automated Manufacturing

ENDORSEMENT TYPES

Prerequisite

Demonstrate an understanding of Career and Technical Education 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.

- CAD/CAM
- Engineering & Design
- Assembly and Working Drawings
- Lab Safety
- CTSO Knowledge

Professional Level Requirements

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

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. Computer-Aided Design and Manufacturing

Ability to use Computer Aided Design and Manufacturing software to plan, design, and manufacture. Demonstrate skills in creating full 3D models using 3D modeling software.

Select **one** of the following options:

- Bachelor's degree in engineering
- Complete a Drafting/Design program from a Technical College
- [Solidworks CAD Design Professional \(CSWP\) Certification](#)
- PRAXIS #5051 Technology Education

3. Engineering & Design

Demonstrate skills in the engineering design process. Have a basic understanding and knowledge of what makes a good design.

Select **one** of the following options:

- Bachelor's degree in engineering
- Complete a Drafting/Design program from a Technical College
- [Solidworks CAD Design Professional \(CSWP\) Certification](#)

4. Assembly and Working Drawings

Be able to read and create proper assembly drawings and working drawings for objects and parts.

Select **one** of the following options:

- Bachelor's degree in engineering
- Complete a Drafting/Design program from a Technical College
- [Solidworks CAD Design Professional \(CSWP\) Certification](#)

5. Lab Safety

Demonstrate and implement comprehensive laboratory and shop safety procedures across all technical domains (construction, manufacturing, electronics, etc.) to ensure a safe learning and working environment.

Select **one** of the following options:

- Bachelor's degree in engineering, computer science, or manufacturing (ex, USU BS Technology & Engineering Education or BYU BS Technology & Engineering Studies)
- PRAXIS #5051 Technology Education
- [OSHA Safety Certification](#)
- Technology & Engineering Lab Safety Microcredential (Coming 2026)

6. CTSO Knowledge

Demonstrate Career and Technical Student Organization (CTSO) knowledge:

- **Help students lead:** Give students opportunities to build their leadership abilities and take charge.
- **Mentor students:** Offer guidance to help students set goals and overcome difficulties as they grow.
- **Manage the organization:** Coordinate meetings, events, and budgets, and handle administrative tasks smoothly.
- **Create helpful programs:** Develop activities that match the CTSO's goals of building leadership, exploring careers, and developing skills.
- **Communicate effectively:** Clearly talk with students, school leaders, and community members, and promote the CTSO.
- **Work with others:** Partner with teachers, businesses, and other organizations to create opportunities like internships and community service.
- **Advocate for CTE:** Promote Career and Technical Education and work to get the resources and recognition it needs.
- **Keep learning:** Stay up-to-date on CTSO management and trends in CTE.
- **Focus on student success:** Support students' interests and celebrate their accomplishments.

Select **one** of the following options:

- **Attend a CTSO Fall Leadership Conference:** Reflected on MIDAS transcripts.
- **USB E Course:** [SkillsUSA Utah Advisor Training](#)
- **USB E Microcredential:** Career & Technical Student Organizations (under development)