

Manufacturing Endorsement

Specifications, Competencies & Requirements

PURPOSE

This endorsement is meant for certified teachers interested in teaching **Manufacturing** courses. It is attached to a current Utah Educator License with a concentration in **Secondary and CTE** Education.

Upon attachment of this endorsement to a Utah educator license, educators are approved to teach courses as outlined in the current school year USBE Assignment Requirements.

The most up-to-date course assignments and codes can be found on the USBE website by navigating to [Administrative & School Supports](#) and selecting the appropriate “**20XX–20XX Assignments Requirement**” link under CACTUS Codes & Data for SYXX (updated annually by school year).

Applicants and LEAs should refer to this resource as the master list for current approved courses and assignment codes associated with this endorsement.

ENDORSEMENT TYPES

Prerequisite

Demonstrate an understanding of Career and Technical Education basics
CTE Knowledge

Associate Level Requirements

Applicants must complete **THREE** of the following competency requirements. The associate-level endorsement is valid for up to 3 school years before it expires. Associate-level endorsements are non-renewable.

- Manufacturing/Production Systems
- Lean/Quality Control
- CAD/CAM
- Plans and Technical Documents
- Machinery (Use and Maintenance)
- Materials Specific Processes (Plastics & Composites)
- 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. Manufacturing /Production Systems

Demonstrate skills and understanding of manufacturing processes, tools, equipment, materials, and quality control procedures.

Select **one** of the following options:

- Bachelor's degree in engineering, computer science, or manufacturing.
- Coursework in CAD, Electronics, Programming, Engineering, and Manufacturing/Production Systems.
- Advanced Manufacturing Undergraduate Certificate

3. Lean/Quality Control

Demonstrate skills in lean principles, statistical analysis, problem-solving, waste identification, and process improvement (combining Lean Manufacturing and Six Sigma concepts).

Select **one** of the following options:

- Hold a bachelor's degree in engineering or a directly related field (e.g., Manufacturing Engineering).
- Lean Manufacturing Bronze Certification
- Six Sigma Yellow Belt
- Advanced Manufacturing Undergraduate Certificate

4. CAD/CAM

Demonstrate skills in creating full 3D models using 3D modeling software. This includes the ability to use CAD/CAM software to plan, design, and manufacture.

Select **one** of the following options:

- Hold a bachelor's degree in engineering or a directly related field (e.g., Manufacturing Engineering).
- OnShape CAD Basics Learning Pathway
- Technical College Drafting/Design program
- Advanced Manufacturing Undergraduate Certificate

5. Plans and Technical Documents

Ability to read and create plans, bills of materials, and material cost estimates. Must also be proficient in interpreting technical drawings and applying geometric dimensioning and tolerancing (GD&T).

Select **one** of the following options:

- Hold a bachelor's degree in engineering or a directly related field (e.g., Manufacturing Engineering).
- PRAXIS #5053 Technology Education
- Complete a Machining program from a technical school
- Advanced Manufacturing Undergraduate Certificate

6. Machinery (Use and Maintenance)

Ability to use and maintain tools and machines used to cut, join, bore, sand, and safely finish wood.

Select **one** of the following options:

- Hold a bachelor's degree in engineering or a directly related field (e.g., Manufacturing Engineering).
- PRAXIS #5053 Technology Education
- Course work equivalent to: UVU CAW 140R, CAW 1170, CAW 2450
- Advanced Manufacturing Undergraduate Certificate

7. Materials Specific Processes (Plastics & Composites)

Possess a strong foundation in composites (matrix/reinforcement roles, types) and an in-depth understanding of the injection molding cycle (material preparation, injection, cooling, ejection) for plastics.

Select **one** of the following options:

- Hold a bachelor's degree in engineering or a directly related field (e.g., Manufacturing Engineering or Materials Science).
- Complete a plastics program from a technical school
- Advanced Manufacturing Undergraduate Certificate

8. 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 #5031 Technology Education
- [OSHA Safety Certification](#)

9. 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 ALTITUDE transcripts.
- **USB E Course:** [SkillsUSA Utah Advisor Training](#)
- **USB E Microcredential:** Career & Technical Student Organizations