Manufacturing Career Cluster

The Manufacturing career cluster focuses on planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance, and process engineering. This career cluster includes occupations ranging from welder and machinist to industrial engineering technician and semi-conductor processing technician.

Statewide Program of Study: Welding

The Welding Program of Study focuses on the development and use of automatic and computer-controlled machines, tools, and robots that perform work on metal or plastic. CTE learners will learn how to modify parts to make or repair machine tools or maintain individual machines and how to use hand-welding or flame-cutting equipment.

Secondary Courses for High School Credit

Level 1	• Principles of Manufacturing • Introduction to Welding
Level 2	• Introduction to Film Interpretation of Weldments • Welding I • Entrepreneurship I
Level 3	• Welding II • Welding II + Welding II Lab
Level 4	• Practicum in Manufacturing • Practicum in Manufacturing + Extended Practicum in Manufacturing • Practicum in Entrepreneurship • Practicum in Entrepreneurship + Extended Practicum in Entrepreneurship • Career Preparation for Programs of Study • Career Preparation for Programs of Study + Extended Career Preparation

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Job shadow a welder • Intern for a local welding company
Expanded Learning Opportunities	• Tour a welding shop • Participate in SkillsUSA or TSA • Participate in a welding project that benefits the community

Aligned Industry-Based Certifications

- API 1104 Welding Pipelines and Related Facilities
- AWS Certified Welder
- AWS D1.1 Structural Steel
- AWS D9.1 Sheet Metal Welding
- AWS SENSE Level 1: Entry Welder
- Construction Technology Certification Level I
- Core
- Industrial Technology Maintenance (ITM) - Maintenance Welding
- Welding - Job Ready
- Welding and Fabrication
- Welding Level 2
- Welding Level I

Example Postsecondary Opportunities

Apprenticeships
- Welding

Associate Degrees
- Welding Technology
- Building/Construction Site Management
- Operations Management and Supervision

Bachelor's Degrees
- Welding Technology
- Construction Management
- Project Management
- Building/Construction Site Management

Master's, Doctoral, and Professional Degrees
- Engineering
- Engineering/Industrial Management
- Manufacturing Engineering
- Construction Engineering

Example Aligned Occupations

Welders, Cutters, Solderers, and Brazers
Median Wage: $48,494
Annual Openings: 5,636
10-Year Growth: 23%

First-Line Supervisors of Production and Operating Workers
Median Wage: $62,514
Annual Openings: 6,566
10-Year Growth: 17%

Industrial Production Managers
Median Wage: $124,377
Annual Openings: 1,544
10-Year Growth: 19%

Data Source: TexasWages, Texas Workforce Commission. Retrieved 3/8/2024.

For more information visit: https://tea.texas.gov/academics/college-career-and-military-prep/career-and-technical-education/m-welding-extendedpptx.pdf

Successful completion of the Welding program of study will fulfill requirements of the Business and Industry endorsement.

Texas Education Agency

Manufacturing Career Cluster

Statewide Program of Study: Welding

Course Information

Level 1

Course	Prerequisites | Corequisites	Career Clusters
Principles of Manufacturing* 13032200 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I or Geometry **Recommended Corequisites:** None	
Introduction to Welding* 13032250 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** Algebra I	

Level 2

Course	Prerequisites | Corequisites	Career Clusters
Introduction to Film Interpretation of Weldments N1303687 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** None	
Welding I* 13032300 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I, Principles of Manufacturing, Introduction to Precision Metal Manufacturing, or Introduction to Welding **Recommended Corequisites:** None	
Entrepreneurship I 13011101 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Business, Marketing, and Finance **Recommended Corequisites:** None	

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Welding II 13032400 (2 credits)	**Prerequisites:** Welding I **Corequisites:** None **Recommended Prerequisites:** Algebra I or Geometry **Recommended Corequisites:** Welding II Lab	

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** Indicates course is included in more than one program of study in this career cluster.*

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Manufacturing Career Cluster

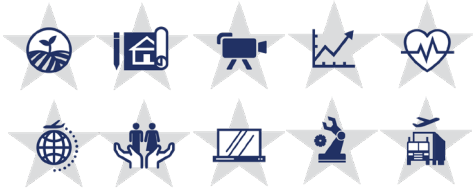
Statewide Program of Study: Welding

Course Information

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Welding II + Welding II Lab 13032410 (3 credits)	**Prerequisites:** Welding I **Corequisites:** None **Recommended Prerequisites:** Algebra I or Geometry **Recommended Corequisites:** None	

Level 4

Course	Prerequisites | Corequisites	Career Clusters
Practicum in Manufacturing* First Time Taken: 13033000 (2 credits) Second Time Taken: 13033010 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Manufacturing + Extended Practicum in Manufacturing* First Time Taken: 13033005 (3 credits) Second Time Taken: 13033015 (3 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Entrepreneurship* First Time Taken: 13011111 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Entrepreneurship I and II, or successful completion of at least two courses in a CTE program of study **Recommended Corequisites:** None	
Practicum in Entrepreneurship + Extended Practicum in Entrepreneurship* First Time Taken: 13011121 (3 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Entrepreneurship I and II or successful completion of at least two courses in a CTE program of study **Recommended Corequisites:** None	

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For additional information on the **Manufacturing** career cluster,
contact cte@tea.texas.gov or visit https://tea.texas.gov/cte

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Manufacturing Career Cluster

Statewide Program of Study: Welding

Level 4

Course Information

Course	Prerequisites | Corequisites	Career Clusters
Career Preparation for Programs of Study* First Time Taken: 12701121 (2 credits)	**Prerequisites:** At least one Level 2 or higher CTE course **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Career Preparation for Programs of Study + Extended Career Preparation* First Time Taken: 12701141 (3 credits)	**Prerequisites:** At least one Level 2 or higher CTE course **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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Welding

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