

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.

Offered to: LMHS and TCHS

Secondary Courses for High School Credit

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|----------------|---|
| Level 1 | <ul style="list-style-type: none"> Business Information Management I (<i>This course is required for a Technology Credit but is not included as a program of study course</i>) |
| Level 2 | <ul style="list-style-type: none"> Introduction to Welding |
| Level 3 | <ul style="list-style-type: none"> Welding I (Required) Applied Mathematics for Technical Professionals (Recommended) |
| Level 4 | <ul style="list-style-type: none"> Welding II |

Aligned Advanced Academic Courses

Dual Credit Dual credit offerings will vary by local education agency.

Students should be advised to consider these course opportunities to enrich their preparation. AP or IB courses not listed under the Secondary Courses for High School Credit section of this framework document do not count towards concentrator/completer status for this program of study.

Work-Based Learning and Expanded Learning Opportunities

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| Work-Based Learning Activities | <ul style="list-style-type: none"> Job shadow a welder Intern for a local welding company |
| Expanded Learning Opportunities | <ul style="list-style-type: none"> Tour a welding shop Participate in Houston Livestock Show and Rodeo ICC Participate in a welding project that benefits the community |

Aligned Industry-Based Certifications

- AWS D1.1 Structural Steel
- AWS D9.1 Sheet Metal Welding
- NCCER Core
- NCCER 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: \$48,177
Annual Openings: 6,792
10-Year Growth: 23%

First-Line Supervisors of Production and Operating Workers

Median Wage: \$62,584
Annual Openings: 5,926
10-Year Growth: 17%

Industrial Production Managers

Median Wage: \$119,691
Annual Openings: 1,296
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/programs-of-study-additional-resources>



Manufacturing Career Cluster

Statewide Program of Study: *Welding*

Course Information

Level 1

Course	Prerequisites Corequisites	Local Course #
Business Information Management I 13011400 (1 credit)	Prerequisites: None Corequisites: None *This course is required for a technology credit but is not included as a program of study course.	7767
In Business Information Management I, students implement personal and interpersonal skills to strengthen individual performance in the workplace and in society and make a successful transition to the workforce and postsecondary education. Students apply technical skills to address business applications of emerging technologies, create word-processing documents, develop a spreadsheet, formulate a database, and make an electronic presentation using appropriate software.		

Level 2

Course	Prerequisites Corequisites	Local Course #
Introduction to Welding 13032250 (1 credit)	Prerequisites: None Corequisites: None Required: Drug testing is mandatory for this course	7813
This course provides the student with job skills in the following areas: electric arc welding oxy/acetylene welding and brazing, basic layout and fabrication, and the development of good work habits. It prepares students to pass the entry level welding exams required for employment. Students must furnish appropriate work clothes to be left in the lab. Students will be required to purchase boots.		

Level 3

Course	Prerequisites Corequisites	Local Course #
Welding I 13032300 (2 credits)	Prerequisites: Introduction to Welding Corequisites: None Recommended Corequisite: Applied Mathematics for Technical Professionals Required: Drug testing is mandatory for this course	7785
This course provides the student with job skills in the following areas: electric arc welding, oxy/acetylene welding and brazing, basic layout and fabrication, and the development of good work habits. It prepares students to pass the entry level welding exams required for employment. Students must furnish appropriate work clothes to be left in the lab. Students will be required to purchase boots.		
Applied Mathematics for Technical Professionals 12701410 (1 credit)	Prerequisites: Construction Technology I Corequisites: None Recommended Corequisite: Welding I	7925
Applied Mathematics for Technical Professionals uses problem-solving situations, hands-on activities, and technology to extend mathematical thinking and engage student reasoning. Situations relating to technical applications provide students opportunities to make connections with mathematics and the workplace. In addition, students will learn the skills necessary to communicate using mathematics. Hands-on activities will allow students to model, explore, and develop abstract concepts applicable to technical careers.		

Level 4

Course	Prerequisites Corequisites	Local Course #
Welding II 13032400 (2 credits)	Prerequisites: Welding I Corequisites: None Required: Drug testing is mandatory for this course	7799
This course provides the student with job skills in the following areas: advanced electric arc welding; SMAW, GTAW, and GMAW welding of plate and pipe; advanced layout and fabrication; and development of self-motivated work skills and habits. Students will be required to purchase boots.		

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