Revised–June 2024

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 manufacturing/process engineering.

Regional Program of Study: Advanced Manufacturing and Industrial Technology Approved in ESC Region 7

The list of approved ESC regions is updated every school year. Be sure to check the CTE regional program of study website for updates.

The Advanced Manufacturing and Industrial Technology program of study focuses on occupational and educational opportunities associated with the development of electrical, mechanical, and machining components of manufacturing processing, automated systems, blueprint and sketching reading, and welding. It includes exploration of a variety of tools including, Computer Numerical Controlled (CNC)machines, hydraulics, and programmable logic controllers for students to learn to fabricate and maintain to processes and move throughmanufacturing production.

Secondary Courses for High School Credit

Level 1	• Principles of Manufacturing • Blueprint Reading for Manufacturing Applications
Level 2	• Agricultural Mechanics and Metal Technologies • Agricultural Mechanics and Metal Technologies + Agricultural Laboratory and Field Experience • Welding I • Diversified Manufacturing I
Level 3	• Digital Electronics • Solid State Electronics
Level 4	• Practicum in Manufacturing • Practicum in Manufacturing + Extended Practicum in Manufacturing • Career Preparation for Programs of Study • Career Preparation for Programs of Study + Extended Career Preparation

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

Work-Based Learning Activities	• Intern at an automation focused manufacturing facility • Job shadow an assembly line process at a manufacturing company
Expanded Learning Opportunities	• Tour a manufacturing facility • Participate in SkillsUSA

Aligned Industry-Based Certifications

- Certified Production Technician (CPT) 4.0
- Certified Manufacturing Associate
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 208 Programmable Controller Troubleshooting 1
- CNC Lathe Operations
- CNC Lathe Set Up and Operations
- Industrial Technology Maintenance (ITM) - Basic Mechanical Systems
- NCCER Core
- NCCER Industrial Maintenance Support Mechanic
- NCCER Industrial Maintenance Mechanic Level I
- Machining CNC Mill Operations Level I
- Machining CNC Mill Programming Setup and Operations Level I
- Machining CNC Milling Skills Level II
- Machining CNC Turning Level II
- Machining Drill Press Level I
- Machining Grinding Level I
- Machining Measurement, Material, and Safety Level I

Successful completion of the Advanced Manufacturing and Industrial Technology program of study will fulfill requirements of the Business and Industry endorsement.

Example Postsecondary Opportunities

Associate Degrees
- Industrial Technology
- Industrial Systems
- Machining Technology

Bachelor's Degrees
- Industrial Technology
- Mechanical Engineering Technology

Master's, Doctoral, and Professional Degrees
- Manufacturing Systems Management
- Supply Chain Management

Additional Stackable IBCs/Licenses
- Precision Machining

Example Aligned Occupations

Industrial Machinery Mechanics
Median Wage: $58,361
Annual Openings: 5,283
10-Year Growth: 35%

Machinists
Median Wage: $48,732
Annual Openings: 3,385
10-Year Growth: 23%

Maintenance and Repair Workers
Median Wage: $37,697
Annual Openings: 14,105
10-Year Growth: 20%

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

Advanced Manufacturing and Industrial Technology

Manufacturing Career Cluster

Regional Program of Study: Advanced Manufacturing and Industrial Technology

Course Information

Level 1

Course	Prerequisites | Corequisites	Career Clusters
Principles of Manufacturing* 13032200 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Blueprint Reading for Manufacturing Applications* N1303684 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I, Geometry, and Principles of Construction **Recommended Corequisites:** None	

Level 2

Course	Prerequisites | Corequisites	Career Clusters
Agricultural Mechanics and Metal Technologies 13002200 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of AFNR **Recommended Corequisites:** None	
Agricultural Mechanics and Metal Technologies + Agricultural Laboratory and Field Experience 13002210 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of AFNR **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	
Diversified Manufacturing I* 13032650 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** None	

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

Advanced Manufacturing and Industrial Technology

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

Manufacturing Career Cluster

Regional Program of Study: Advanced Manufacturing and Industrial Technology

Course Information

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Digital Electronics* 13037600 (1 credit)	**Prerequisites:** Algebra I and Geometry **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Solid State Electronics* 13036900 (1 credit)	**Prerequisites:** AC/DC Electronics **Corequisites:** None **Recommended Prerequisites:** None **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	
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	

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

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

Advanced Manufacturing and Industrial Technology