

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: Industrial Maintenance

The Industrial Maintenance program of study focuses on occupational and educational opportunities associated with maintaining and repairing manufacturing equipment and facilities. This program of study includes exploration of facility systems including electrical, welding, hydraulics, plumbing, heating, and air conditioning.



Secondary Courses for High School Credit

Level 1	- Principles of Manufacturing - Introduction to Welding - Introduction to Small Engine Technology
Level 2	- Construction Technology I - Electrical Technology I - Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I - Industrial Maintenance (TBD)
Level 3	- Basic Fluid Power - Mechanical Maintenance (TBD)
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

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities

- Shadow an equipment inspector at a power plant
- Intern at a local manufacturing company that makes hydraulics or automobiles

Expanded Learning Opportunities

- Tour a manufacturing facility
- Participate in SkillsUSA

Aligned Industry-Based Certifications

- Basic Hydraulic Systems
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 201 Electrical Systems 1
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 202 Electric Motor Control Systems 1
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 204 Motor Control Troubleshooting 1
- Carpentry Level I
- Certified Fluid Power Level 1
- Certified Fluid Power Level 2
- Certified Fluid Power Level 3
- Certified Logistics Technician (CLT)
- Certified Production Technician (CPT) 4.0
- Certified Technician-Supply Chain Automation (CT-SCA)
- Construction Technology Certification Level I
- Core
- Electrical Level I
- Electrical Level II
- Electronic System Technician Level I
- Electronic System Technician Level II
- Employment Ready Certification - Air Conditioning
- Employment Ready Certification - Electrical
- Employment Ready Certification - Gas Heat
- Employment Ready Certification - Heat Pumps
- Employment Ready Certification - Light Commercial Air Conditioning
- Fundamentals of Fluid Power - Hydraulics/Pneumatics
- HBI Pre-Apprenticeship Certificate Training (PACT), Core
- HBI Pre-Apprenticeship Certificate Training (PACT), Heating, Ventilation and Air Conditioning
- HVACR Level I
- Industrial Maintenance Mechanic Level I
- Industrial Maintenance Support Mechanic
- Industrial Millwright
- Industrial Technology Maintenance (ITM) - Basic Mechanical Systems
- Industrial Technology Maintenance (ITM) - Basic Pneumatic Systems
- Industrial Technology Maintenance (ITM) - Electrical Systems
- Industrial Technology Maintenance (ITM) - Maintenance Operations
- Licensed Service Technician
- Millwright Level I
- Millwright Level II
- Sheet Metal Level I



Example Postsecondary Opportunities

Apprenticeships

- Millwright Apprentice

Associate Degrees

- Industrial Technology
- Instrumentation Technology
- Industrial Mechanics and Maintenance Technology
- Building/Property Maintenance

Bachelor's Degrees

- Engineering/Industrial Management
- Industrial Engineering
- Industrial Technology
- Industrial Mechanics and Maintenance Technology

Master's, Doctoral, and Professional Degrees

- Engineering/Industrial Management
- Industrial Engineering
- Materials Engineering
- Manufacturing Engineering



Example Aligned Occupations

Electrician's Helpers

Median Wage: \$42,692
Annual Openings: 1,299
10-Year Growth: 20%

Millwrights

Median Wage: \$58,305
Annual Openings: 311
10-Year Growth: 17%

Industrial Engineers

Median Wage: \$102,022
Annual Openings: 1,996
10-Year Growth: 26%

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-industrial-maintenance-extendedpptx.pdf>



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Statewide Program of Study: Industrial Maintenance

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	
Introduction to Small Engine Technology 13040000 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

Level 2

Course	Prerequisites Corequisites	Career Clusters
Construction Technology I 13005100 (2 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Construction or Principles of Architecture Recommended Corequisites: None	
Electrical Technology I 13005600 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Architecture or Principles of Construction Recommended Corequisites: None	
Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I 13005800 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Architecture, Principles of Construction, or Construction Technology I Recommended Corequisites: None	
Industrial Maintenance TBD (TBD credit)	Prerequisites: TBD Corequisites: TBD Recommended Prerequisites: TBD Recommended Corequisites: TBD	

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

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

