

# 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: Robotics and Automation Technology

The Robotics and Automation Technology program of study focuses on occupational and educational opportunities associated with the assembly, operation, maintenance, and repair of electromechanical equipment or devices. This program of study includes exploration of a variety of mechanical fields, including robotics, refinery and pipeline systems, deep ocean exploration, and hazardous waste removal.



### Secondary Courses for High School Credit

Level 1 • Principles of Applied Engineering

Level 2 • Robotics I

Level 3 • Robotics II  
• Engineering Design and Presentation I

Level 4 • 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

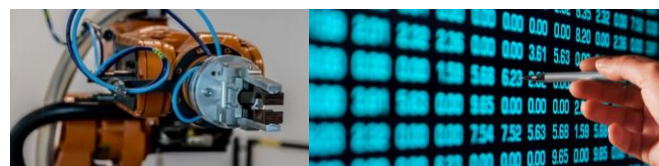
- Intern with a robotics technician working at a manufacturing plant
- Shadow a PLC programmer

#### Expanded Learning Opportunities

- Tour a manufacturing facility
- Participate in SkillsUSA or TSA
- Build a robot and participate in a robotics competition

### Aligned Industry-Based Certifications

- C-101 Certified Industry 4.0 Associate - Basic Operations
- C-103 Certified Industry 4.0 Associate - Robot System Operations
- C-200 Certified Industry 4.0 Automation System Specialist I - 216 Robotic System Integration 1
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 208 Programmable Controller Troubleshooting I
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 215 Robotic Operations I
- Certified Manufacturing Associate
- Certified SOLIDWORKS Professional (CSWP) - Additive Manufacturing
- Certified SOLIDWORKS Professional (CSWP) – CAM
- CNC Lathe Operations
- CNC Lathe Set Up and Operations
- FANUC Robot Operator I
- FESTO Certified Industry 4.0 Associate Fundamentals
- Industrial Technology Maintenance (ITM) - Process Control Systems
- 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
- Certified Logistics Technician (CLT)
- Certified Production Technician (CPT) 4.0
- Lean Six Sigma Green Belt Certification
- Certified Technician-Supply Chain Automation (CT-SCA)
- Machining Milling Level I
- Machining Drill Press Level I
- Machining Grinding Level I



### Example Postsecondary Opportunities

#### Associate Degrees

- Instrumentation Technology
- Industrial Technology
- Robotics Technology
- Automation Engineer Technology

#### Bachelor's Degrees

- Mechanical Engineering
- Electrical Electronics Engineering
- Electrical, Electronic, and Communications Engineering Technology
- Electromechanical Engineering Technology

#### Master's, Doctoral, and Professional Degrees

- Mechanical Engineering
- Engineering/Industrial Management
- Industrial Engineering
- Electrical and Electronics Engineering



### Example Aligned Occupations

#### Computer Numerically Controlled Tool Operators

Median Wage: \$46,353  
Annual Openings: 1,146  
10-Year Growth: 10%

#### Semiconductor Processing Technicians

Median Wage: \$36,902  
Annual Openings: 621  
10-Year Growth: 9%

#### Industrial Engineers

Median Wage: \$100,000  
Annual Openings: 1,898  
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/programs-of-study-additional-resources>



# Manufacturing Career Cluster

## Statewide Program of Study: Robotics and Automation Technology

### Course Information

| Level 1 | Course  | Prerequisites   Corequisites  | Career Clusters   |
|---------|---|---|---|
|         | <b>Principles of Applied Engineering*</b><br>13036200 (1 credit)  | <b>Prerequisites:</b> None<br><b>Corequisites:</b> None<br><b>Recommended Prerequisites:</b> None<br><b>Recommended Corequisites:</b> None                                      |      |
| Level 2 | Course  | Prerequisites   Corequisites  | Career Clusters   |
|         | <b>Robotics I</b><br>13037000 (1 credit)  | <b>Prerequisites:</b> None<br><b>Corequisites:</b> None<br><b>Recommended Prerequisites:</b> Principles of Applied Engineering<br><b>Recommended Corequisites:</b> None         |     |
| Level 3 | Course  | Prerequisites   Corequisites  | Career Clusters   |
|         | <b>Robotics II</b><br>13037050 (1 credit)   | <b>Prerequisites:</b> Robotics I<br><b>Corequisites:</b> None<br><b>Recommended Prerequisites:</b> None<br><b>Recommended Corequisites:</b> None                                |     |
|         | <b>Engineering Design and Presentation I</b><br>13036500 (1 credit)   | <b>Prerequisites:</b> Algebra I<br><b>Corequisites:</b> None<br><b>Recommended Prerequisites:</b> Principles of Applied Engineering<br><b>Recommended Corequisites:</b> None    |     |
| Level 4 | Course  | Prerequisites   Corequisites  | Career Clusters   |
|         | <b>Career Preparation for Programs of Study + Extended Career Preparation for Programs of Study*</b><br>First Time Taken:<br>12701141 (3 credits) | <b>Prerequisites:</b> At least one Level 2 or higher CTE course<br><b>Corequisites:</b> None<br><b>Recommended Prerequisites:</b> None<br><b>Recommended Corequisites:</b> 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](mailto:cte@tea.texas.gov) or visit <https://tea.texas.gov/cte>