



Principles of Manufacturing
Principles of Applied Engineering

Level 1

Occupational Safety and Environmental Technology I
Robotics I
Manufacturing Engineering Technology I
Programmable Logic Controller I

Level 2

Engineering Design and Presentation I
Manufacturing Engineering Technology II
Robotics II
Occupational Safety and Environmental Technology II
Programmable Logic Controller II

Level 3

Practicum in Manufacturing
Practicum in Entrepreneurship
Career Preparation I

Level 4

| HIGH SCHOOL/INDUSTRY CERTIFICATION | CERTIFICATE/LICENSE* | ASSOCIATE'S DEGREE | BACHELOR'S DEGREE | MASTER'S/DOCTORAL PROFESSIONAL DEGREE |
|---|--------------------------------|---|------------------------|---------------------------------------|
| FANUC Robot Operator 1 | Engineer, Professional | Electro-mechanical Engineering/Technology | Electrical Engineering | Electrical Engineering |
| Mastercam Associate Level Certification | Certified Quality Technician | Certified Quality Technician | Industrial Engineering | Industrial Engineering |
| NCCER Industrial Maintenance Mechanic | Plant Maintenance Technologist | Industrial Mechanics and Maintenance Technology | Mechanical Engineering | Mechanical Engineering |
| NIMS Industrial Technology Maintenance - Maintenance Operations | | | | |

| Occupations | Median Wage | Annual Openings | % Growth |
|--------------------------------|-------------|-----------------|----------|
| Electro-Mechanical Assemblers | \$30,160 | 951 | 9% |
| Electro-Mechanical Technicians | \$56,555 | 127 | 9% |
| Industrial Machinery Mechanics | \$49,816 | 3,788 | 27% |

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

| Exploration Activities: | Work Based Learning Activities: |
|--|--|
| Participate in SkillsUSA and local STEM events | Apprenticeship at a local business or industry American Welding Society |

Additional industry-based certification information is available on the TEA CTE website. For more information on postsecondary options for this program of study, visit TXCTE.org.

The Advanced Manufacturing and Machinery Mechanics program of study focuses on the assembly, operation, maintenance, and repair of electromechanical equipment or devices. CTE learners may work in a variety of mechanical fields, gaining knowledge and experience in robotics, refinery and pipeline systems, deep ocean exploration, or hazardous waste removal. CTE concentrators may work in a variety of fields of engineering.



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.

Successful completion of the Advanced Manufacturing and Machinery program of study will fulfill requirements of the Business and Industry or STEM endorsement if the math and science requirements are met. Revised - July 2020



COURSE INFORMATION

| COURSE NAME | SERVICE ID | PREREQUISITES (PREQ) COREQUISITES (CREQ) | Grade |
|---|--|--|-------|
| Principles of Manufacturing | 13032200 (1 credit) | None | 9-12 |
| Occupational Safety and Environmental Technology I | N1303680 (1 credit) | None | 9-12 |
| Principles of Applied Engineering | 13036200 (1 credit) | None | 9-10 |
| Engineering Design and Presentation I | 13036500 (1 credit) | PREQ: Algebra I | 10-12 |
| Occupational Safety and Environmental Technology II | N1303681 (1 credit) | PREQ: OSET I | 9-12 |
| Manufacturing Engineering Technology I | 13032900 (1 credit) | None | 10-12 |
| Robotics I | 13037000 (1 credit) | None | 9-10 |
| Programmable Logic Controller I | N1303689 (1 credit) | None | 10-12 |
| Manufacturing Engineering Technology II | 13032950 (1 credit) | PREQ: Manufacturing Engineering Technology I | 11-12 |
| Robotics II | 13037050 (1 credit) | PREQ: Robotics I | 10-12 |
| Programmable Logic Controller II | N1303690 (1 credit) | None | 11-12 |
| Practicum in Manufacturing | 13033000 (2 credits) 13033005 (3 credits) 13033010 (2 credits) 13033015 (3 credits) | None | 12 |
| Practicum in Entrepreneurship | N1303425 (2 credits) | None | 11-12 |
| Career Preparation I | 12701300 (2 credits) 12701305 (3 credits) | None | 11-12 |
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FOR ADDITIONAL INFORMATION ON THE MANUFACTURING CAREER CLUSTER,
PLEASE CONTACT: CTE@tea.texas.gov
<https://tea.texas.gov/cte>