

Business & Industry Endorsement

CAREER CLUSTER

PROGRAMS OF STUDY



- **ADVANCED
MANUFACTURING &
MACHINERY MECHANICS**
- **WELDING**



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.

Advanced Manufacturing and Machinery Mechanics Statewide Program of Study



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.

Secondary Courses for High School Credit

Level 1

- Principles of Applied Engineering

Level 2

- Robotics I
- Manufacturing Engineering Technology I

Level 3

- Robotics II

Level 4

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Postsecondary Opportunities

Associates Degrees

- Electromechanical Engineering/Technology
- Certified Quality Technician
- Industrial Mechanics and Maintenance Technology

Bachelor's Degrees

- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering

Master's, Doctoral, and Professional Degrees

- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering



Work-Based Learning and Expanded Learning Opportunities

Exploration Activities

- Participate in SkillsUSA and local STEM events

Work-Based Learning Activities

- Work at a local business or industry apprenticeship
- Join the American Welding Society

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 1
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 215 Robotic Operations 1
- Certified Manufacturing Associate
- Certified SOLIDWORKS Professional (CSWP) – CAM
- Certified SOLIDWORKS Professional (CSWP) – Additive Manuf.
- CNC Lathe Operations
- CNC Lathe Set Up and Operations
- FANUC Robot Operator 1
- FESTO Certified Industry 4.0 Associate Fundamentals
- Industrial Technology Maintenance (ITM) - Process Control Sys.
- Machining CNC Mill Operations Level I
- Machining CNC Mill Programming Setup and Operations Level I
- Machining CNC Milling Skills Level II
- Machining CNC Milling Skills Level II

- Industrial Technology Maintenance (ITM) - Electronic Control Systems*
- ISCET Certified Electronics Technicians*
- Mastercam Associate Certification Mill Design and Toolpaths*
- Mastercam Certified Professional Mill Level 1*
- Mastercam Professional Level Certification*
- ^OSHA 30 Hour General

^Offered at Donna ISD

*IBC sunseting 8/31/24

Aligned Occupations

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%

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

Revised – August 2022

Advanced Manufacturing and Machinery Mechanics Course Information

Level 1

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Principles of Manufacturing	13032200 (1 credit)	None	None
Principles of Applied Engineering	13036200 (1 credit)	None	None

Level 2

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Occupational Safety and Environmental Technology I	N1303680 (1 credit)	None	None
Robotics I	13037000 (1 credit)	None	None
*Manufacturing Engineering Technology I	13032900 (1 credit)	None	None
*Programmable Logic Controller I	N1303689 (1 credit)	None	None

Level 3

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Engineering Design and Presentation I	13036500 (1 credit)	Algebra I	None
*Manufacturing Engineering Technology II	13032950 (1 credit)	Manufacturing Engineering Technology I	None
Robotics II	13037050 (1 credit)	Robotics I	None
*Occupational Safety and Environmental Technology II	N1303681 (1 credit)	OSET I	None
*Programmable Logic Controller II	N1303690 (1 credit)	None	None

Level 4

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Practicum in Manufacturing	13033000 (2 credits) 13033005 (3 credits) 13033010 (2 credits) 13033015 (3 credits)	None	None
*Practicum in Entrepreneurship	N1303425 (2 credits)	None	None
*Career Preparation I	12701300 (2 credits) 12701305 (3 credits)	None	None

*Not Currently Offered at Donna ISD

FOR ADDITIONAL INFORMATION ON THE MANUFACTURING CAREER CLUSTER,
PLEASE CONTACT: CTE@tea.texas.gov OR VISIT <https://tea.texas.gov/cte>

The Public Notification of Nondiscrimination can be found in our Donna ISD's CTE webpage
at <https://tx50000621.schoolwires.net/Domain/76>

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.

Welding Statewide Program of Study



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.

Secondary Courses for High School Credit

Level 1

- Introduction to Welding CC

Level 2

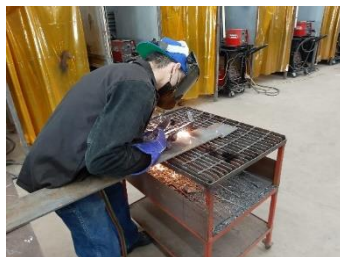
- Welding I CC

Level 3

- Welding II/Lab CC

Level 4

- Practicum in Manufacturing CC



Work-Based Learning and Expanded Learning Opportunities

Exploration Activities	Work-Based Learning Activities
<ul style="list-style-type: none"> • Participate and compete in SkillsUSA • Job shadow a machinist 	<ul style="list-style-type: none"> • Work in a local business or industry apprenticeship • Join the American Welding Society

Industry-Based Certifications

- API 1104 Welding Pipelines and Related Facilities
- AWS Certified Welder
- ^AWS D1.1 Structural Steel
- ^AWS D9.1 Sheet Metal Welding
- AWS SENSE Level 1: Entry Welder
- Industrial Technology Maintenance (ITM) - Maintenance Welding
- NCCER Construction Technology Certification Level I
- NCCER Core
- NCCER Welding Level I
- Welding - Job Ready

^OSHA 30 Hour General*

^Offered at Donna ISD

*IBC sunsetting 8/31/24

Postsecondary Opportunities

Associates Degrees

- Certified Welder or Welder Inspector
- Machine Shop Technology/Assistant
- Operations Management and Supervision
- Occupational Safety and Health Technology/Technician

Bachelor's Degrees

- Welding Engineering Technology/Technician
- Biomedical Technology/Technician
- Operations Management and Supervision
- Environmental Health

Master's, Doctoral, and Professional Degrees

- Welding Engineering Technology/Technician
- Occupational Health and Industrial Hygiene
- Operations Management and Supervision
- Environmental Health



Aligned Occupations

Occupations	Median Wage	Annual Openings	% Growth
Welders, Cutters, Solderers, and Brazers	\$41,350	6,171	9%
Welding Soldering and Brazing Machine Setters, Operators and Tenders	\$40,040	280	9%

Successful completion of the Welding program of study will fulfill requirements of the Business and Industry endorsement. Revised – August 2022

Welding Course Information

Level 1

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Introduction to Welding	13032250 (1 credit)	None	None

Level 2

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Welding I	13032300 (2 credits)	None	None
*Introduction to Film Interpretation of Weldments	N1303687 (1 credit)	None	None

Level 3

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Welding II/Lab	13032400 (2 credits) 13032410 (3 credits)	Welding I	None

Level 4

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Practicum in Manufacturing	13033000 (2 credits) 13033005 (3 credits) 13033010 (2 credits) 13033015 (3 credits)	None	None
*Practicum in Entrepreneurship	N1303425 (2 credits)	None	None
*Career Preparation I	12701300 (2 credits) 12701305 (3 credits)	None	None

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