Revised–May 2024

Agriculture, Food, and Natural Resources Career Cluster

The Agriculture, Food, and Natural Resources (AFNR) career cluster focuses on the essential elements of life, food, water, land, and air. This career cluster includes occupations ranging from farmer, rancher, and veterinarian to geologist, land conservationist, and florist.

Statewide Program of Study: Agricultural Technology and Mechanical Systems

The Agricultural Technology and Mechanical Systems program of study focuses on occupational and educational opportunities associated with applying engineering technology and biological science to agricultural problems related to power and machinery, electrification, structures, soil and water use, and processing agricultural products. This program of study includes diagnosing, repairing, or overhauling farm machinery and vehicles, such as tractors, harvesters, dairy equipment, and irrigation systems.

THS Course Offerings for Ag Technology and Mechanics Systems

Level 1 Freshman	• Principles of Agriculture, Food, and Natural Resources This class will help students expand their leadership and communication skills while furthering knowledge of the effects of agriculture on our world.
Level 2 Sophomore	• Agricultural Mechanics and Metal Technologies Students will actively learn how to properly use tools to work with various materials, including concrete, electricity, plumbing, and basic carpentry. Proper safety is also integral in learning how to weld using Oxy-Fuel, Arc, and M.I.G. techniques.
Level 3 Junior	• Agricultural Structures Design and Fabrication Students who complete Advanced Ag Mechanics will develop the skills necessary to design agricultural structures, utilize and diagnose power systems, use welding technology effectively, and construct metal projects. Instruction will also emphasize job opportunities in these areas.
Level 4	• Agricultural Equipment Design and Fabrication Students will acquire knowledge and skills related to the design and fabrication of agricultural equipment. Students must attain knowledge and skills in agricultural equipment design and fabrication to prepare for careers in mechanized agriculture and technical systems.

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Participate in a farm mechanic apprenticeship at an equipment production company • Intern at an equipment manufacturing facility working with agricultural engineers
Expanded Learning Opportunities	• Participate in an FFA career, leadership, and speaking contest like an agriscience fair • Participate in an agriculture robotics event

Aligned Industry-Based Certifications

- AWS D1.1 Structural Steel
- AWS D9.1 Sheet Metal Welding

Successful completion of the Agricultural Technology and Mechanical Systems program of study will fulfill requirements of the Business and Industry endorsement.



Example Postsecondary Opportunities

Apprenticeships
- Farm Equipment Mechanic I

Associate Degrees
- Diesel Mechanics Technology
- Industrial Mechanics and Maintenance Technology

Bachelor's Degrees
- Agricultural Engineering
- Agricultural Systems Management

Master's, Doctoral, and Professional Degrees
- Agricultural Engineering
- Industrial Technology

Additional Stackable IBCs/License
- Diesel Equipment Technology-Off Highway Specialization CER1
- Accredited Farm Manager

Example Aligned Occupations

Farm Equipment Mechanics and Service Technicians
Median Wage: $46,582
Annual Openings: 326
10-Year Growth: 23%

Mobile Heavy Equipment Mechanics
Median Wage: $57,943
Annual Openings: 2,637
10-Year Growth: 31%

Farmers, Ranchers, and Other Agricultural Managers
Median Wage: $65,490
Annual Openings: 28,020
10-Year Growth: 4%

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

Agricultural Technology and Mechanical Systems