



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.

Secondary Courses for High School Credit

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|----------------|--|
| Level 1 | <ul style="list-style-type: none"> Principles of Agriculture, Food, and Natural Resources |
| Level 2 | <ul style="list-style-type: none"> Agricultural Mechanics and Metal Technologies Agricultural Mechanics and Metal Technologies + Agricultural Laboratory and Field Experience |
| Level 3 | <ul style="list-style-type: none"> Agricultural Structures Design and Fabrication Agricultural Structures Design and Fabrication + Agricultural Laboratory and Field Experience Agricultural Power Systems Agricultural Power Systems + Agricultural Laboratory and Field Experience Geographic Information Systems (GIS) for Agriculture |
| Level 4 | <ul style="list-style-type: none"> Agricultural Equipment Design and Fabrication Agricultural Equipment Design and Fabrication + Agricultural Laboratory and Field Experience Career and Technology Project-Based Capstone Practicum in Agriculture, Food, and Natural Resources Practicum in Agriculture, Food, and Natural Resources + Extended Practicum in Agriculture, Food, and Natural Resources Career Preparation for Programs of Study Career Preparation for Programs of Study + Extended Career Preparation Scientific Research and Design |



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



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

- | | |
|---|--|
| <ul style="list-style-type: none"> Agriculture Mechanics 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 Core Industrial Technology Maintenance (ITM) - Basic Pneumatic Systems | <ul style="list-style-type: none"> Industrial Technology Maintenance (ITM) - Maintenance Welding Machining Measurement, Material, and Safety Welding - Job Ready Welding and Fabrication Welding Level 2 Welding Level I |
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Example Aligned Occupations

Farm Equipment Mechanics and Service Technicians

Median Wage: \$41,258
Annual Openings: 315
10-Year Growth: 23%

Mobile Heavy Equipment Mechanics

Median Wage: \$60,005
Annual Openings: 2,315
10-Year Growth: 31%

Farmers, Ranchers, and Other Agricultural Managers

Median Wage: \$79,064
Annual Openings: 30,363
10-Year Growth: 4%





Agriculture, Food, and Natural Resources Career Cluster

Statewide Program of Study: Agricultural Technology and Mechanical Systems

Course Information

Level 1

Course	Prerequisites Corequisites	Career Clusters
Principles of Agriculture, Food, and Natural Resources* 13000200 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

Level 2

Course	Prerequisites Corequisites	Career Clusters
Agricultural Mechanics and Metal Technologies 13002200 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Agriculture, Food, and Natural Resources Recommended Corequisites: None	 
Agricultural Mechanics and Metal Technologies + Agricultural Laboratory and Field Experience 13002210 (2 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Agriculture, Food, and Natural Resources Recommended Corequisites: None	 

Level 3

Course	Prerequisites Corequisites	Career Clusters
Agricultural Structures Design and Fabrication 13002300 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Agricultural Mechanics and Metal Technologies Recommended Corequisites: None	
Agricultural Structures Design and Fabrication + Agricultural Laboratory and Field Experience 13002310 (2 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: Agricultural Mechanics and Metal Technologies Recommended Corequisites: None	
Agricultural Power Systems 13002400 (2 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Agriculture, Food, and Natural Resources Recommended Corequisites: None	
Agricultural Power Systems + Agricultural Laboratory and Field Experience 13002410 (3 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Agriculture, Food, and Natural Resources Recommended Corequisites: None	

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

For additional information on the **Agriculture, Food, and Natural Resources** career cluster, contact cte@tea.texas.gov or visit <https://tea.texas.gov/cte>



Agriculture, Food, and Natural Resources Career Cluster

Statewide Program of Study: Agricultural Technology and Mechanical Systems

Course Information

Level 3

Course

Prerequisites | Corequisites

Career Clusters

Geographic Information Systems (GIS) for Agriculture
13002450 (1 credit)

Prerequisites: None
Corequisites: None
Recommended Prerequisites: Principles of Agriculture, Food, and Natural Resources
Recommended Corequisites: None



Level 4

Course

Prerequisites | Corequisites

Career Clusters

Agricultural Equipment Design and Fabrication
13002350 (1 credit)

Prerequisites: None
Corequisites: None
Recommended Prerequisites: Agricultural Mechanics and Metal Technologies
Recommended Corequisites: None



Agricultural Equipment Design and Fabrication + Agricultural Laboratory and Field Experience
13002360 (2 credits)

Prerequisites: None
Corequisites: None
Recommended Prerequisites: Agricultural Mechanics and Metal Technologies
Recommended Corequisites: None



Career and Technical Education Project-Based Capstone*
First Time Taken:
12701101 (1 credit)

Prerequisites: None
Corequisites: None
Recommended Prerequisites: None
Recommended Corequisites: None



Practicum in Agriculture, Food, and Natural Resources*
First Time Taken:
13002500 (2 credits)
Second Time Taken:
13002510 (2 credits)

Prerequisites: A minimum of two credits with at least one course in a Level 2 or higher course from the Agriculture, Food, and Natural Resources career cluster
Corequisites: None
Recommended Prerequisites: None
Recommended Corequisites: None



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Agriculture, Food, and Natural Resources Career Cluster

Statewide Program of Study: Agricultural Technology and Mechanical Systems

Course Information

Level 4

Course	Prerequisites Corequisites	Career Clusters
Practicum in Agriculture, Food, and Natural Resources + Extended Practicum in Agriculture, Food, and Natural Resources* First Time Taken: 13002505 (3 credits) Second Time Taken: 13002515 (3 credits)	Prerequisites: A minimum of two credits with at least one course in a Level 2 or higher course from the Agriculture, Food, and Natural Resources career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Career Preparation for Programs of Study* First Time Taken: 12701121 (2 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	           
Career Preparation for Programs of Study + Extended Career Preparation* First Time Taken: 12701141 (3 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	           
Scientific Research and Design* 13037200 (1 credit)	Prerequisites: Biology, and one credit of the following: Physics for Engineering, chemistry, Integrated Physics and Chemistry (IPC), or physics Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	     

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