

# 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 a diverse spectrum of occupations, ranging from farmer, rancher, and veterinarian to geologist, land conservationist, and florist. It also includes non-traditional agricultural occupations like wind energy, solar energy, and oil and gas production.

## Applied Agricultural Engineering Statewide Program of Study



The Applied Agricultural Engineering program of study explores the occupations and educational opportunities associated with applying knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing agricultural products. This program of study may also include exploration into diagnosing, repairing, or overhauling farm machinery and vehicles, such as tractors, harvesters, dairy equipment, and irrigation systems.

### Courses for Santa Rosa High School Credit

#### Level 1 (9<sup>th</sup> Grade)

- Principles of Agriculture, Food, and Natural Resources

#### Level 2 (10<sup>th</sup> grade)

- Agricultural Mechanics and Metal Technologies/Lab

#### Level 3 (11<sup>th</sup> Grade)

- Agricultural Structures Design and Fabrications/Lab

#### Level 4 (12<sup>th</sup> Grade)

- Agricultural Equipment Design and Fabrication/Lab

### Postsecondary Opportunities

#### Associates Degrees

- Heavy Equipment Maintenance Technology/ Technician
- Agricultural Mechanization, General
- Small Engine Mechanics and Repair Technology/ Technician
- Welding Technology/ Welder

#### Bachelor's Degrees

- Agricultural Engineering
- Agricultural Mechanization, General

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

- Agricultural Engineering
- Agricultural Mechanization, General

### Work-Based Learning and Expanded Learning Opportunities

#### Exploration Activities

- Tour a farm products or machinery plant
- Participate in Texas FFA

#### Work-Based Learning Activities

- Earn a welding certification
- Intern at a farm products or machinery plant
- Participate in an FFA supervised agriculture experience

### Industry-Based Certifications

- Agriculture Mechanics
- API 1104 Welding Pipelines and Related Facilities AWS Certified Welder
- AWS Certified Welder (SRHS)
- AWS D1.1 Structural Steel (SRHS)
- AWS D9.1 Sheet Metal Welding (SRHS)
- AWS SENSE Level 1: Entry Welder
- Feedyard Technician in Machinery Operation, Repair and Maintenance
- Industrial Technology Maintenance (ITM) - Maintenance Welding
- Machining Measurement, Material, and Safety Level I
- NCCER Welding Level I
- NCCER Core
- General Welding - Job Ready

- OSHA General 30\*

\*IBC sunseting 8/31/24

### Aligned Occupations

Occupations	Median Wage	Annual Openings	% Growth
Outdoor Power Equipment and Other Small Engine Mechanics	\$32,406	366	16%
Welders	\$41,350	6171	9%
Farm Equipment Mechanics and Service Technicians	\$39,915	304	17%
Mobile Heavy Equipment Mechanics	\$47,299	1627	16%
Agricultural Engineers	\$64,792	9	13%

Successful completion of the Applied Agricultural Engineering program of study will fulfill requirements of a **Business and Industry endorsement or STEM endorsement** if the math and science requirements are met. Revised – October 2022

# Applied Agricultural Engineering Course Information

## Level 1 (9<sup>th</sup> Grade)

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	None

## Level 2 (10<sup>th</sup> Grade)

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Agricultural Mechanics and Metal Technologies	13002200 (1 credit)	None	None

## Level 3 (11<sup>th</sup> Grade)

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Agricultural Structures Design and Fabrications	13002300 (1 credit)	None	None

## Level 4 (12<sup>th</sup> Grade)

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Agricultural Equipment Design and Fabrication/Lab	13002350 (1 credit) 13002360 (2 credits)	None	None

FOR ADDITIONAL INFORMATION ON THE AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER,  
PLEASE CONTACT: [CTE@tea.texas.gov](mailto:CTE@tea.texas.gov)  
<https://tea.texas.gov/cte>

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Further nondiscrimination information can be found at [Notification of Nondiscrimination in Career and Technical Education Programs](#).