

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.

Secondary Courses for High School Credit

Level 1

- Principles of Agriculture, Food, and Natural Resources

Level 2

- Agricultural Mechanics and Metal Technologies (WLDG1323/WLDG1317)

Level 3

- Agricultural Structures Design and Fabrications (WLDG1353 & WLDG1428/WLDG1407 & WLDG1457)

Level 4

- Practicum in Ag, Food, and Natural Resources – Welding (WLDG1202 & WLDG1430/WLDG1206 & WLDG2443)

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 | Work-Based Learning Activities |
|---|---|
| <ul style="list-style-type: none"> Tour a farm products or machinery plant Participate in Texas FFA | <ul style="list-style-type: none"> Earn a welding certification Intern at a farm products or machinery plant Participate in an FFA supervised agriculture experience |

Industry-Based Certifications

- AWS D1.1 Structural Steel
 - AWS D9.1 Sheet Metal Welding
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- OSHA 10



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 – August 2022

Applied Agricultural Engineering Course Information

Level 1

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

Level 2

| COURSE NAME | SERVICE ID | PREREQUISITES | COREQUISITES |
|---|---------------------|---------------|--------------|
| Agricultural Mechanics and Metal Technologies (WLDG1323/WLDG1317) | 13002200 (1 credit) | None | None |

Level 3

| COURSE NAME | SERVICE ID | PREREQUISITES | COREQUISITES |
|---|---------------------|---------------|--------------|
| Agricultural Structures Design and Fabrications (WLDG1353 & WLDG1428/WLDG1407 & WLDG1457) | 13002300 (1 credit) | None | None |

Level 4

| COURSE NAME | SERVICE ID | PREREQUISITES | COREQUISITES |
|---|----------------------|---------------|--------------|
| Practicum in Agriculture, Food, and Natural Resources (WLDG1202 & WLDG1430/WLDG1206 & WLDG2443) | 13002500 (2 credits) | None | None |

FOR ADDITIONAL INFORMATION ON THE AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER,
PLEASE CONTACT: 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.](#)