



Principles of Agriculture, Food, and Natural Resources

**Level 1**

Agricultural Mechanics and Metal Technologies/Lab

**Level 2**

Agricultural Structures Design and Fabrications/Lab  
Agricultural Power Systems/Lab  
Geographic Information Systems for Agriculture (TBD)

**Level 3**

Agricultural Equipment Design and Fabrication/Lab  
Practicum in Agriculture, Food, and Natural Resources  
Project-Based Research  
Scientific Research and Design

**Level 4**

HIGH SCHOOL/INDUSTRY CERTIFICATION	CERTIFICATE/LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/DOCTORAL PROFESSIONAL DEGREE
OSHA 30 Hour General Industry	Certified Professional Agronomist	Heavy Equipment Maintenance Technology/Technician	Agricultural Engineering	Agricultural Engineering
Feedyard Technician in Machinery, Operation, Repair and Maintenance	Certified Reliability Engineer	Agricultural Mechanization, General	Agricultural Mechanization, General	Agricultural Mechanization, General
AWS SENSE Welding Level 1	Certified Irrigation Designer	Small Engine Mechanics and Repair Technician/Technician		
AWS D1.1 or D9.1 Certification	Fluid Power Mobile Hydraulic Mechanic	Welding Technology/Welder		

Occupations	Median Wage	Annual Openings	% Growth
Outdoor Power Equipment and Other Small Engine Mechanics	\$32,406	366	16%
Welders	\$41,350	6,171	9%
Farm Equipment Mechanics and Service Technicians	\$39,915	304	17%
Mobile Heavy Equipment Mechanics	\$47,299	1,627	16%
Agricultural Engineers	\$64,792	9	13%

Additional industry-based certification information is available on the TEA CTE website. For more information on postsecondary options for this program of study, visit TXCTE.org.

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES	
<b>Exploration Activities:</b>	<b>Work Based Learning Activities:</b>
Tour a farm products or machinery plant Texas FFA	Earn a welding certification Intern at a farm products or machinery plant FFA Supervised Agriculture Experience (SAE)

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.



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.

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 - July 2020



# COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITS (PREQ) COREQUISITES (CREQ)	Grade
Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	9-12
Agricultural Mechanics and Metal Technologies/Lab	13002200 (1 credit) 13002210 (2 credits)	None	10-12
Agricultural Structures Design and Fabrications/Lab	13002300 (1 credit) 13002310 (2 credits)	None	11-12
Agricultural Power Systems/Lab	13002400 (2 credits) 13002410 (3 credits)	None	10-12
Geographic Information Systems for Agriculture	TBD	TBD	TBD
Agricultural Equipment Design and Fabrication/Lab	13002350 (1 credit) 13002360 (2 credits)	None	11-12
Practicum in Agriculture, Food, and Natural Resources	13002500 (2 credits) 13002505 (3 credits) 13002510 (2 credits) 13002515 (3 credits)	None	11-12
Project-Based Research	12701500 (1 credit)	None	11-12
Scientific Research and Design	13037200 (1 credit)	PREQ: Biology, Chemistry, Integrated Physics, and Chemistry (IPC), or Physics	11-12

FOR ADDITIONAL INFORMATION ON THE AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER, PLEASE CONTACT:

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<https://tea.texas.gov/cte>