

Applied Agricultural Engineering Program of Study *Business and Industry Endorsement*



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 conversation, 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.

To complete the Program of Study, students must earn four credits in the Program of Study and one of the credits must be an Advanced Level course.

POSTSECONDARY OPTIONS

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	
Feedyard Technician in Machinery, Operation, Repair and Maintenance	Certified Reliability Engineer	Agricultural Mechanization, General	Agricultural Mechanization, General	
AWS SENSE Welding Level 1	Certified Irrigation Designer	Small Engine Mechanics and Repair Technology/ Technician		
AWS D1.1 or D9.1 Certification	Fluid Power Mobile Hydraulic Mechanic	Welding Technology/ Welder		

Additional industry based certification information is available from the TEA CTE website.

For more information on postsecondary options for this program of study, visit TXCTE.org.

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%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:
Tour a farm products or
machinery plant
Texas FFA

**Work Based Learning
Activities:**
Earn a welding certification;
intern at a farm products or
machinery plant

Courses in this Program of Study

PRINCIPLES OF AGRICULTURE, FOOD & NATURAL RESOURCES

Course # 07081000

Recommended Grade Placement 9

1 CREDIT

This course helps students prepare for careers in agriculture, food and natural resources, students must develop academic skills and knowledge in agriculture. This course covers career opportunities, leadership, communications, and the FFA. Technical agricultural topic covered will include: soils, plants, animals, agricultural construction, food science, and welding.

AGRICULTURAL MECHANICS & METAL TECHNOLOGIES

Course # 07221710

Recommended Grade Placement 10-11

1 CREDIT

A course designed to introduce basic theory and specialized skills in agricultural mechanics. Skills to be developed include tool identification and safe use, painting, metal working, and welding processes

AGRICULTURAL POWER SYSTEMS

Course # 07221760

Recommended Grade Placement 10-11

2 CREDITS

A course designed to develop an understanding of power and control systems as related to energy sources, small and large power systems, and agricultural machinery. To prepare for careers in agricultural power, structural, and technical systems, students must attain academic skills and knowledge; acquire technical knowledge and skills related to power, structural, and technical agricultural systems and the workplace; and develop knowledge and skills regarding career opportunities, entry requirements, industry certifications, and industry expectations.

AGRICULTURAL STRUCTURES DESIGN AND FABRICATION

Course # 07221770

Recommended prerequisite: Agricultural Mechanics and Metal Technologies

Recommended Grade Placement 11-12

1 CREDIT

In Agricultural Structures Design and Fabrication, students will explore career opportunities, entry requirements, and industry expectations. To prepare for careers in mechanized agriculture and technical systems, students must attain knowledge and skills related to agricultural structures design and fabrication. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer their academic knowledge and technical skills in a variety of settings.

PRACTICUM IN AGRICULTURE, FOOD & NATURAL RESOURCES

Course # 07221950

Prerequisite: At least one prior Agriculture, Food, and Natural Resources credit

Recommended Grade Placement 12

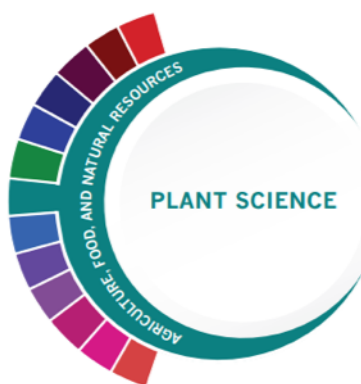
2 CREDITS

The practicum or Coop course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Agriculture, Food, and Natural Resources cluster. Students are required to serve in paid or unpaid internship opportunities. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.

Courses in Program of Study (Prerequisites noted in course descriptions)

To complete the Program of Study, students must earn four credits in the Program of Study and one of the credits must be an Advanced Level course.

Entry Level Courses	Advanced Courses
Principles of Agriculture, Food, and Natural Resources	Agricultural Structures Design and Fabrication Lab (preferred course)
Agricultural Mechanics and Metal Technologies	Agricultural Power Systems
	Agricultural Equipment Design and Fabrication (preferred course)
	Practicum in Agriculture, Food, and Natural Resources



Plant Science

Business and Industry Endorsement

The Plant Science program of study focuses on the science, research, and business of plants and other living organisms. It teaches students how to apply biology and life science to real-world life processes of plants and vegetation, either in laboratories or in the field.

To complete the Program of Study, students must earn four credits in the Program of Study and one of the credits must be an Advanced Level course.

POSTSECONDARY OPTIONS

HIGH SCHOOL/INDUSTRY CERTIFICATION	CERTIFICATE/LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/DOCTORAL PROFESSIONAL DEGREE
Landscape Irrigation Technician License	Pesticide Applicator	Applied Horticulture/ Horticulture Operations, General		
Commercial/Noncommercial Pesticide Applicator	Certified Floral Designer	Ornamental Horticulture	Agronomy and Crop Science	
Texas State Floral Association Level One Floral Certification	Accredited Member of AIFD	Agricultural Business and Management, General		
Texas State Floral Association Level Two Floral Certification	Landscape Industry Certified Technician	Turf and Turfgrass Management	Farm/Farm and Ranch Management	

Additional industry based certification information is available from the TEA CTE website.

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OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Soil and Plant Scientists	\$54,662	116	21%
Tree Trimmers and Pruners	\$32,240	589	14%
Pesticide Handlers, Sprayers, and Applicators	\$36,733	196	22%
Landscaping Supervisors	\$44,408	807	19%
Biological Technicians	\$42,931	452	17%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:
Texas FFA

Work Based Learning Activities:
Work part-time at a florist;
start or work for a local landscaping business