

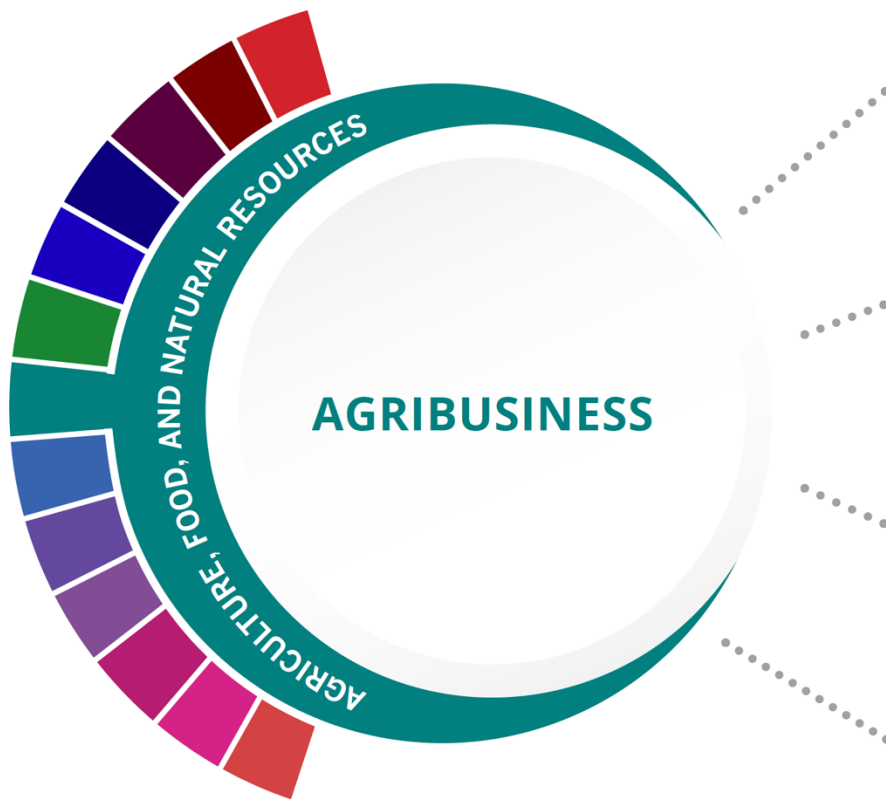


AGRIBUSINESS

ANIMAL SCIENCE

**ENVIRONMENTAL
AND NATURAL
RESOURCES**

PLANT SCIENCE



Level 1 Principles of Agriculture, Food, and Natural Resources

Professional Communications

Level 2

Agribusiness Management and Marketing

Level 3

Practicum in Agriculture, Food, and Natural Resources

Level 4

Career Preparation I

HIGH SCHOOL/INDUSTRY CERTIFICATION	CERTIFICATE/LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/DOCTORAL PROFESSIONAL DEGREE
	Certified Professional Public Buyer	Agricultural Business and Management, General	Agricultural Business and Management, General	Agricultural Business and Management, General
		Banking and Financial Support Services	Finance, General	Finance, General
		Advertising	Financial Mathematics	Financial Mathematics
		Marketing/Marketing Management, General	Marketing/Marketing Management, General	Marketing/Marketing Management, General

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.

Occupations	Median Wage	Annual Openings	% Growth
Farmers, Ranchers, and Other Agricultural Managers	\$59,134	405	9%
Farm and Ranch Loan Officers	\$45,594	268	25%
Buyers and Purchasing Agents, Farm Products	\$46,488	102	20%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:	Work Based Learning Activities:
Tour a farm machinery products company Texas FFA	Internship with a farm machinery products company; Work on a farm or ranch FFA Supervised Agriculture Experience (SAE)

The Agribusiness program of study explores the occupations and educational opportunities associated with the business of farming and agriculturally related business that supplies farm inputs, such as machinery and seeds. This program of study may also include exploration into the marketing of farm products, the purchase of farm products either for further processing or resale and grading or classifying unprocessed food or other agricultural products.



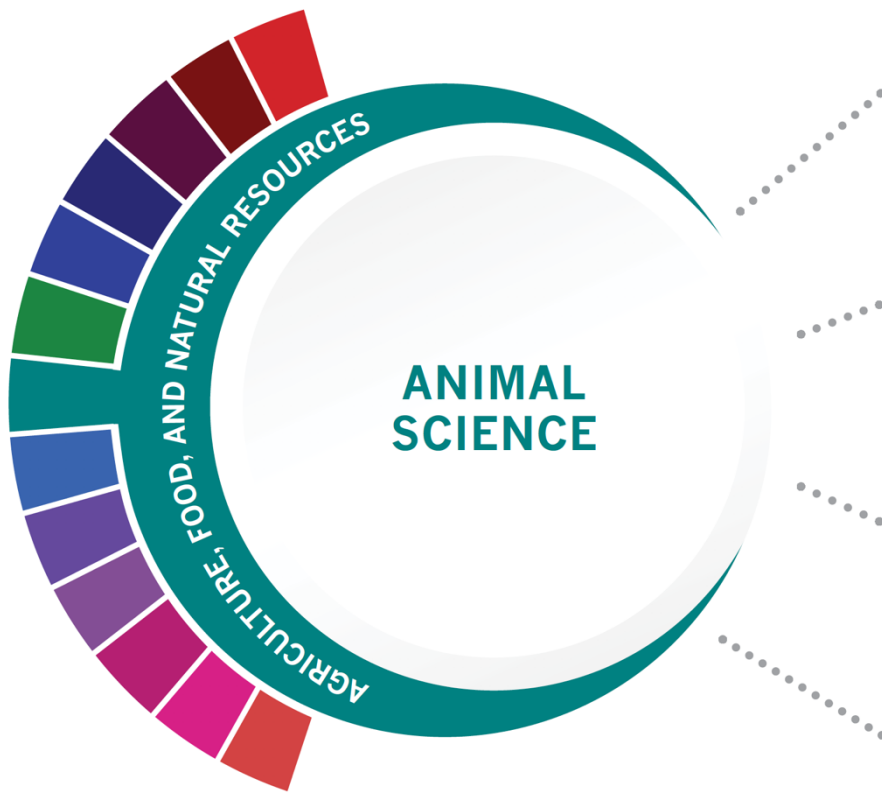
The Agriculture, Food, and Natural Resources (AFNR) Career Cluster focuses on the essential elements of life—food, water, land, and air. This career cluster includes a diverse spectrum of occupations, ranging from farmer, rancher, and veterinarian to geologist, land conservationist, and florist. It also includes non-traditional agricultural occupations like wind energy, solar energy, and oil and gas production.

Successful completion of the Agribusiness program of study will fulfill requirements of the Business and Industry Endorsement. Revised - July 2020

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITS (PREQ) COREQUISITES (CREQ)	Grade
5100 Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	9-12
7220 Professional Communications	13009900 (.5 credit)	None	9-12
5101 Agribusiness Management and Marketing	13000900 (1 credit)	Recommended PREQ: Principles of Ag or Principles of Business	10-12
5130 Practicum in Agriculture, Food, and Natural Resources	13002510 (2 credits)	PREQ: Agribusiness Management and Marketing	11-12
5090 Career Preparation I 5091 Career Prep I/Ext	12701300 (2 credits) 12701305 (3 credits)	None	11-12

AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER
AGRIBUSINESS



Level 1	Principles of Agriculture, Food, and Natural Resources
Level 2	Small Animal Management Equine Science
Level 3	Livestock Production Veterinary Medical Applications
Level 4	Advanced Animal Science Practicum in Agriculture, Food, and Natural Resources – Cert Vet Asst. Project-Based Research ISM - Scientific Research and Design

HIGH SCHOOL/INDUSTRY CERTIFICATION	CERTIFICATE/LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/DOCTORAL PROFESSIONAL DEGREE
Licensed Veterinary Technician	Pet Groomer	Food Science and Technology	Animal Sciences	Genetics
Feed yard Technician in Cattle Care and Handling	Veterinary Technician	Veterinary Studies	Agriculture	Veterinary Medicine
FHS - Certified Veterinary Assistant	Licensed Breeder	Biotechnology Laboratory Technician	Biology	Biological and Physical Sciences
		Biology Technician	Zoology/Animal Biology	Biological and Biomedical Sciences

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.

Occupations	Median Wage	Annual Openings	% Growth
Animal Breeders	\$39,135	28	9%
Animal Scientists	\$57,533	22	12%
Medical Scientists	\$63,898	435	27%
Veterinarians	\$93,496	294	24%
Zoologists and Wildlife Biologists	\$67,309	45	32%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:	Work Based Learning Activities:
Texas FFA	Agri-Science Fair 4H Volunteer at a local farm or veterinary office FFA Supervised Agriculture Experience (SAE)

The Animal Science program of study focuses on the science, research, and business of animals and other living organisms. It teaches CTE learners how to apply biology and life science to real-world life processes of animals and wildlife, either in laboratories or in the field, which could include a veterinary office, a farm or ranch, or any outdoor area harboring animal life. Students may also research and analyze the growth and destruction of species and research or diagnose diseases and injuries of animals.



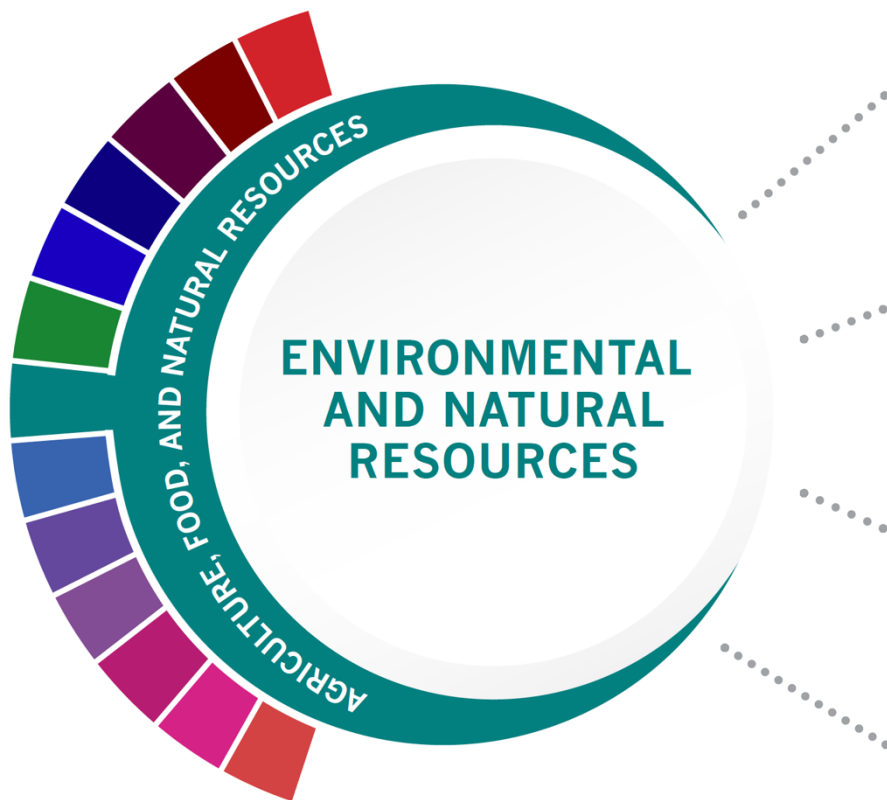
The Agriculture, Food, and Natural Resources (AFNR) Career Cluster focuses on the essential elements of life—food, water, land, and air. This career cluster includes a diverse spectrum of occupations, ranging from farmer, rancher, and veterinarian to geologist, land conservationist, and florist. It also includes non-traditional agricultural occupations like wind energy, solar energy, and oil and gas production.

Successful completion of the Animal Science 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
5100 Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	9-12
5190 Small Animal Management	13000400 (0.5 credit)	Recommended PREQ: Principles of Ag	9-12
5135 Equine Science	13000500 (0.5 credit)	Recommended PREQ: Principles of Ag	9-12
5185 Livestock Production	13000300 (1 credit)	Recommended PREQ: Principles of Ag	10-12
5155 Advanced Animal Science	13000700 (1 credit)	PREQ: Biology and Chemistry or IPC; Algebra I and Geometry; and either Small Animal Management, Equine Science, or Livestock Production	11-12
5105 Veterinary Medical Applications	13000600 (1 credit)	PREQ: Equine Science, Small Animal Management, or Livestock Production	11-12
5150 Practicum in Ag, Food, & Natural Resources (Cert Vet Asst)	13002500 (2 credits)	PREQ: Vet Med Applications Course #5105	12
5130 Practicum in Ag, Food, & Natural Resources	13002510 (2 credits)	PREQ: At least one course in Animal Science	11-12
5008 Project-Based Research	12701500 (1 credit)	None	11-12
0030 ISM - Scientific Research and Design May count as science credit	13037200 (1 credit)	PREQ: Biology, Chemistry, IPC, or Physics	11-12

AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER
ANIMAL SCIENCE



Level 1 Principles of Agriculture, Food, and Natural Resources

Wildlife, Fisheries, and Ecology Management

Level 2

Project-Based Research

Level 3

Practicum in Agriculture, Food, and Natural Resources
ISM - Scientific Research and Design

HIGH SCHOOL/INDUSTRY CERTIFICATION	CERTIFICATE/LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/DOCTORAL PROFESSIONAL DEGREE
Wastewater Collections, Class 1	Board Certified Environmental Engineer - Hazardous Waste Management	Environmental Science	Environmental Science	Environmental Science
Water Operators, Class D	Certified Water Technologist	Environmental Studies	Environmental/Environmental Health Engineering	Environmental/Environmental Health Engineering
OSHA Hazardous Waste Operations and Emergency Response	Certified Environmental Scientist	Wildlife, Fish, and Woodlands Science and Management	Wildlife, Fish, and Woodlands Science and Management	Wildlife, Fish, and Woodlands Science and Management
	Certified in Public Health	Environmental Engineering Technology/Environmental Technology	Natural Resources Law Enforcement and Protective Services	Fishing and Fisheries Science and Management

Occupations	Median Wage	Annual Openings	% Growth
Environmental Engineering Technicians	\$53,352	101	32%
Environmental Engineers	\$86,757	288	25%
Environmental Science and Protection Technicians, Including Health	\$40,268	508	17%
Environmental Scientists and Specialists, Including Health	\$77,896	644	24%
Zoologists and Wildlife Biologists	\$67,309	45	32%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:	Work Based Learning Activities:
Attend summer leadership events Texas FFA	Intern at a waste treatment plant FFA Supervised Agriculture Experience (SAE)

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.

The Environmental and Natural Resources program of study explores the occupations and educational opportunities associated with the research, design, and planning of engineering or technical duties in the prevention and control of environmental hazards. This program of study may also include exploration into conducting research for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population.



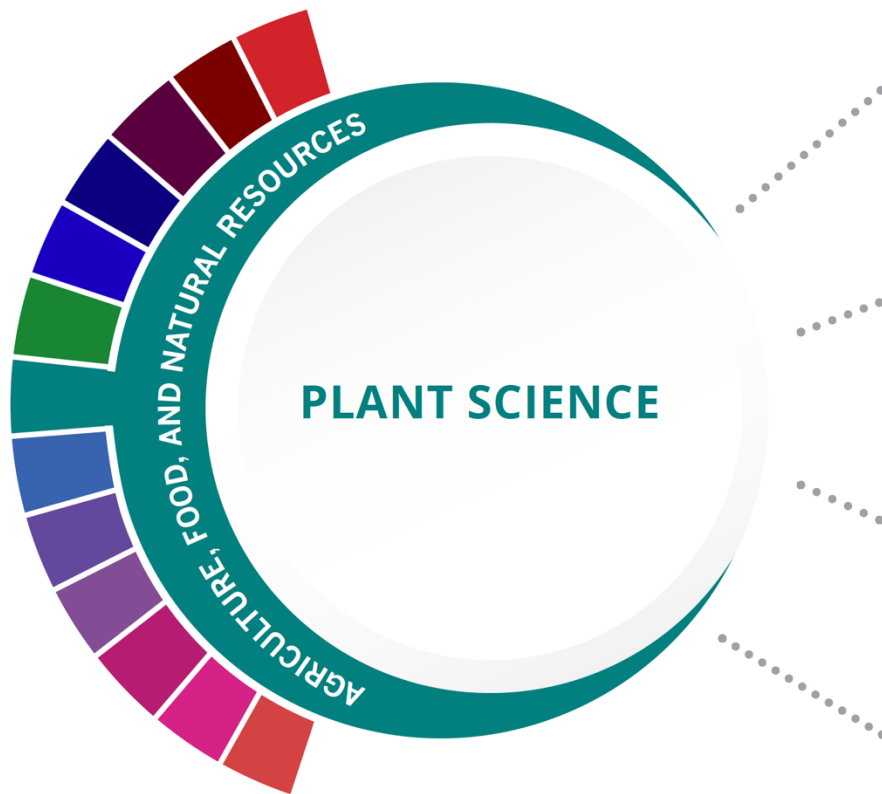
The Agriculture, Food, and Natural Resources (AFNR) Career Cluster focuses on the essential elements of life—food, water, land, and air. This career cluster includes a diverse spectrum of occupations, ranging from farmer, rancher, and veterinarian to geologist, land conservationist, and florist. It also includes non-traditional agricultural occupations like wind energy, solar energy, and oil and gas production.

Successful completion of the Environmental and Natural Resources program of study will fulfill requirements of the Business and Industry Endorsement. Revised - July 2020

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITS (PREQ) COREQUISITES (CREQ)	Grade
5100 Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	9-12
5165 Wildlife, Fisheries, and Ecology Management	13001500 (1 credit)	Recommended PREQ: Principles of Ag	10-12
5008 Project-Based Research	12701500 (1 credit)	None	11-12
5130 Practicum in Agriculture, Food, and Natural Resources	13002510 (2 credits)	PREQ: Wildlife, Fisheries, and Ecology Management	11-12
0030 ISM - Scientific Research and Design May count as science credit	13037200 (1 credit)	PREQ: Biology, Chemistry, IPC, or Physics	11-12

AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER
ENVIRONMENTAL AND NATURAL RESOURCES



Level 1 Principles of Agriculture, Food, and Natural Resources

Floral Design
Horticulture

Level 2

Advanced Plant and Soil Science
Advanced Floral Design

Level 3

Practicum in Agriculture, Food, and Natural Resources
Project-Based Research
ISM - Scientific Research and Design

Level 4

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	Applied Horticulture/Horticulture Operations, General	Applied Horticulture/Horticulture Operations, General
Commercial/Noncommercial Pesticide Applicator	Certified Floral Designer	Ornamental Horticulture	Agronomy and Crop Science	Agronomy and Crop Science
FHS - Texas State Floral Association Level One Floral Certification	Accredited Member of AIFD	Agricultural Business and Management, General	Agricultural Business and Management, General	Agricultural Business and Management, General
FHS - Texas State Floral Association Level Two Floral Certification	Landscape Industry Certified Technician	Turf and Turfgrass Management	Turf and Turfgrass Management	Farm/Farm and Ranch Management

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:	Work Based Learning Activities:
Texas FFA	Work part-time at a florist; start or work for a local landscaping business FFA Supervised Agriculture Experience (SAE)

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.

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.



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 Plant Science 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
5100 Principles of Agriculture, Food, and Natural Resources	13000200 (1 credit)	None	9-12
5175 Floral Design May count as Fine Arts credit	13001800 (1 credit)	None	10-12
5195 Horticulture	13002000 (1 credit)	Recommended PREQ: Principles of Ag	10-12
5180 Advanced Floral Design	N1300270 (1 credit)	PREQ: Floral Design and Texas Floral Level 1 Certificate	11-12
5160 Advanced Plant and Soil Science May count as science credit	13002100 (1 credit)	One course from Plant Science and Biology, IPC, Chemistry, or Physics	11-12
5130 Practicum in Agriculture, Food, and Natural Resources	13002510 (2 credits)	PREQ: 1 class from Plant Science Program of Study	11-12
5008 Project-Based Research	12701500 (1 credit)	None	11-12
0030 ISM - Scientific Research and Design May count as science credit	13037200 (1 credit)	PREQ: Biology, Chemistry, IPC, or Physics	11-12

AGRICULTURE, FOOD, AND NATURAL RESOURCE CAREER CLUSTER
PLANT SCIENCE