



CAREER PATHWAY

AGRIBUSINESS & PRODUCTION SYSTEMS

Animal Caretakers | Farmworkers & Laborers (Crop, Nursery, Greenhouse) | Water & Wastewater Treatment Plant & Systems Operator | Biological Technicians | Food Science Technicians | Buyers & Purchasing Agents | Veterinarians

CAREER TECHNICAL COURSES

7	
8	Agriculture, Food & Natural Resources (7th - 9th)
9	Animal and Plant Science (7th-9th)
10	Mechanical Principles (10th-12th) Livestock Selection, Nutrition & Management (10th-12th) Animal Health (10th-12th)
11	Meat Science and Technology (10th-12th) Science and Technology of Food (10th-12th) Greenhouse & Nursery Management (10th-12th)
12	Energy Systems Management (11th-12th) Business Management for Agricultural and Environmental Systems Agricultural and Environmental Systems Capstone

INDUSTRY CREDENTIAL OPPORTUNITIES

- Center for Innovative Food Technology Approved Food Industry Specialist - **12 Points**
- Ohio Certified Nursery Technician - Garden Center - **12 Points**
- Elanco Fundamentals of Animal Science Certification - **6 Points**
- Elanco Veterinary Medical Applications Certification - **6 Points**
- SoftSkills Pro - **1 Point**
- CSAW (Chainsaw Safety Awareness) Levels 1 & 2 - **3 Points**
- Ohio Driver's License - **1 Point**
- OSHA-10 - **1 Point**
- CPR First Aid - **1 Point**
- Leadership Excellence - Student - **3 Points**
- Lean Six Sigma Yellow Belt - **3 Points**
- Lean Six Sigma Green Belt - **6 Points**

COLLEGE CREDIT OPPORTUNITIES

Students who demonstrate proficiency in career tech courses in approved secondary programs can receive college credit for their approved coursework.

POTENTIAL PLACEMENT & INCOME - 

**May 2024 State Occupational Employment and Wage Estimates for Ohio*

Animal Caretakers		\$34,220
Farmworkers & Laborers Crop, Nursery & Greenhouse		\$36,860
Food Science Technicians		\$54,330
Biological Technicians		\$55,460
Water & Wastewater Treatment Plant & Systems Operator		\$57,850
Buyers & Purchasing Agents		\$76,600
Veterinarians		\$130,370





SUBJECT CODE **010105**

AGRICULTURE, FOOD & NATURAL RESOURCES

This first course in the career field is an introduction to Agricultural and Environmental Systems. Students will be introduced to the scope of the Agricultural and Environmental Systems career field. They will examine principles of food science, natural resource management, animal science & management, plant & horticultural science, power technology and bioscience. Students will examine the FFA organization and Supervised Agricultural Experience programs. Throughout the course, students will develop communication, leadership and business skills essential to the agriculture industry.

SUBJECT CODE **010125**

ANIMAL AND PLANT SCIENCE

Students will apply knowledge of animal and plant science to the agriculture industry. They will be introduced to the value of production animals relative to the agricultural marketplace. Students will engage in animal classification and selection, body systems, along with animal welfare and behavior in relation to the production of animals. Students will learn principles of plant anatomy and physiology, and the role of nutrition, deficiencies and growing environment on plant production. Throughout the course, business principles and professional skills will be examined.

SUBJECT CODE **010120**

MECHANICAL PRINCIPLES

Students will engage in the mechanical principles utilized in animal and plant production systems. They will learn electrical theory, design, wiring, hydraulic and pneumatic theory, along with metallurgy in relation to hot and cold metals. Students will apply knowledge of sheet metal fabrication applicable to the agricultural industry along with identify, diagnose, and maintain small air-cooled engines. Throughout the course, students will learn critical components of site and personal safety as well as communication and leadership skills.

SUBJECT CODE **010920**

LIVESTOCK SELECTION, NUTRITION & MANAGEMENT

CTASM001
College Credit - 3 Hours

Learners will apply principles of nutrition, health and reproduction to the management of animals, poultry and fish in production agriculture. Learners will demonstrate understanding of anatomy and physiology and apply genetic principles for improvement. Learners will apply knowledge of animal behavior, welfare, and husbandry principles. Learners will evaluate body/carcass composition and apply marketing principles to the sale and distribution of livestock products. Learners will employ communication, business, and management strategies appropriate for the industry.

SUBJECT CODE **010915**

ANIMAL HEALTH

Learners will apply principles of nutritional management for various classes of animals. Learners will analyze nutritional content/quality of feeds; formulate rations; develop feeding recommendations; identify deficiency symptoms and implement corrective methods as needed. Care/management plans are developed that reflect the classification of animals and follows best practices and legal compliance. Learners will monitor/evaluate the quality of animal habitats and estimate carrying capacity as it relates to the impact of the environment and animal health.

SUBJECT CODE **011020**

MEAT SCIENCE & TECHNOLOGY

Learners will apply food chemistry and microbiology to processing, preservation, packaging, storage and marketing of meat products. Learners will design and implement a quality assurance program that meets legal compliance. Learners will evaluate carcass composition, assign quality grades, and examine value-added products. Learners will demonstrate knowledge of safety regulations and operate and maintain equipment and facilities. Learners will practice customer service and sales techniques while understanding the scope and importance of business regulations.

SUBJECT CODE **011010**

SCIENCE AND TECHNOLOGY OF FOOD

CTFSC001
College Credit - 3 Hours

This first course in the pathway examines the research, marketing, processing and packaging techniques applied to the development of food products. Learners will examine principles of food preservation techniques and determine correlations to food sensory, shelf life and food stability. Learners will examine and develop food safety, sanitation, and quality assurance protocol. Government regulations and food legislation will be examined and the implications to food science and technology will be identified.

SUBJECT CODE **010610**

GREENHOUSE AND NURSERY MANAGEMENT

CTAGP002
College Credit - 3 Hours

The course will apply principles of science, engineering, and business to support the sustainable propagation and production of plants in a commercial nursery or greenhouse facility. Management of soil/media, water and nutrient distribution, lighting, ventilation and temperature, and pests will be learned and applied. Students will demonstrate knowledge of propagation methods, plant health, nutrition, and growth stimulation. Students will develop successful business, communication, marketing, and sales strategies for use in the greenhouse and nursery industries.

SUBJECT CODE **010715**

ENERGY SYSTEMS MANAGEMENT

CTAE001
College Credit - 3 Hours

Students will apply basic principles of energy accounting, thermodynamics and heat transfer, energy conversion and efficiency to heating, power generation and transportation. Students will apply the principles and practices needed for managing both renewable and non-renewable energy sources including, solar thermal, hydrogen generation, photovoltaic, hydroelectric, biomass use, geothermal heat transfer, and fossil fuel. Future energy systems and energy use scenarios are investigated, with a focus on promoting the use of renewable energy resources and technologies.

SUBJECT CODE **010115**

BUSINESS MANAGEMENT FOR AGRICULTURAL & ENVIRONMENTAL SYSTEMS

CTAGP003
College Credit - 3 Hours

Students will examine elements of business, identify organizational structures and apply management skills while developing business plans, financial reports and strategic goals for new ventures or existing businesses. Learners will use marketing concepts to evaluate the marketing environment and develop a marketing plan with marketing channels, product approaches, promotion and pricing strategies. Throughout the course, students will apply concepts of ethics and professionalism while implications of business regulations will be identified.

SUBJECT CODE **010190**

AGRICULTURAL AND ENVIRONMENTAL SYSTEMS CAPSTONE

Students apply Agricultural and Environmental Systems program knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, and internships.