Introduction to Agriculture

Course Number	491150
Grade Level	8-12
Career Cluster	Agriculture
Pathway	All Agriculture
Course Sequence	Level 1
CTSO	FFA
Industry Recognized Credential	https://forms.act.org/certificate/pdf/NCRC-InformationFlyer.pdf
Minimum Equipment List	NONE
Course Description	

CIP Codes	CIP Title
1.0000	Agriculture, General
1.0101	Agricultural Business and Management, General
1.0204	Agricultural Power Machinery Operation
1.0301	Agricultural Production Operations, General
1.0601	Applied Horticulture/Horticultural Operations, General
1.0901	Animal Sciences, General
1.1101	Plant Sciences, General

SOC Codes	SOC Title
45-2091	Agricultural Equipment Operators
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals
11-9013	Farmers, Ranchers, and Other Agricultural Managers
19-1011	Animal Scientists
19-1013	Soil and Plant Scientists
17-2021	Agricultural Engineers
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers
13-1074	Farm and Home Management Advisors

Course Standards

Introduction to Agriculture Domain 1 Analyze the importance of agriculture	
Standard 1.1 Explain the importance of agriculture.	
Performance Indicators	
1.1.1	Explain the importance of agriculture in meeting basic human needs (e.g., food, fiber, shelter, etc.)
1.1.2	Identify how agricultural products provide materials for clothing, construction, and daily necessities.
1.1.3	Describe the connection between agricultural production and human survival.
1.1.4	Describe the impact of agriculture on Arkansas' economy (e.g., rice, soybeans, broilers, forest products, etc.).
1.1.5	Identify Arkansas's top agricultural commodities and their economic value.
1.1.6	List employment opportunities created by Arkansas agriculture.
1.1.7	Compare Arkansas agriculture's contribution to the state and national economy.
Standard 1.2 Examine the agricultural industry.	
Performance Indicators	
1.2.1	List and describe the three major areas of agricultural industry (e.g., supplies & services, production agriculture, and marketing & processing)
1.2.2	Identify local examples of agricultural industry areas.
1.2.3	Describe the interconnectedness of industries as related to agriculture.
1.2.4	Explain changes in agriculture due to technology (e.g., genetic engineering, GPS, computerized equipment).

1.2.5	Discuss how technology has improved efficiency and sustainability in agriculture.

Domain 2
Explore FFA and Leadership in the agricultural industry

Standard 2.1 Identify FFA Basics.

Performance Indicators	
2.1.1	Explain the Three Circle Model (Classroom instruction, Experiential Learning/SAE, and FFA/Leadership).
2.1.2	Describe how each component contributes to comprehensive agricultural education.
2.1.3	Identify and explain the meaning of symbols in the official FFA emblem.
2.1.4	Explain the significance of the official FFA colors (National Blue and Corn Gold).
2.1.5	Demonstrate knowledge of official FFA dress standards and appropriate occasions.
2.1.6	Explain the significance of these dates in FFA history: 1917 (Smith-Hughes Act), 1928(Formation of Future Farmers of America), 1965 (New Farmers of America merges with FFA), 1969 (FFA opens membership to females), 1988 (Name changed to National FFA Organization).
2.1.7	Explain the significance of the FFA Creed.
2.1.8	Interpret the FFA Motto: "Learning to Do, Doing to Learn, Earning to Live, Living to Serve"
2.1.9	Demonstrate the proper FFA Salute.
2.1.10	Recite and explain the FFA Mission Statement.
2.1.11	List the degrees an FFA member may earn (Discovery, Greenhand, Chapter, State, and American) and explain the requirements for each degree level.
2.1.12	Explain the meaning and symbol for each FFA officer station.
2.1.13	Describe the duties and responsibilities of each officer position.
2.1.14	Demonstrate knowledge of proper officer ceremony procedures.

Standard 2.2 Practice FFA leadership opportunities.	
Performance Indicators	
2.2.1	Identify Leadership Development Events (LDE) (extemporaneous speaking, prepared public speaking, creed speaking, parliamentary procedure, conduct of chapter meetings, job interview, discussion meet).
2.2.2	Apply public speaking and communication skills while participating in selected LDEs.
2.2.3	Discuss the three major divisions of the Program of Activities (growing leaders, building communities, strengthening agriculture) and describe activities that would fit each division.
2.2.4	List and apply the four main objectives of parliamentary law (to discuss only one item at a time, to show courtesy to everyone, to abide by the rule of the majority, and to respect the rights of the minority).
2.2.5	Use Robert's Rules of Order in group situations.
2.2.6	Practice leadership skills through structured meetings.
Domain 3 **Explore experiential learning and supervised agricultural experiences**	
Standard 3.1 Determine career pathways in Agriculture and Energy & Natural Resources.	
Performance Indicators	
3.1.1	Identify the four pathways in the Agriculture career cluster (Agribusiness Systems, Animal Systems, Plant Systems, and Power, Structural & Technical Systems).
3.1.2	Explore career opportunities within each pathway specific to Arkansas.
3.1.3	Connect pathway studies to local Arkansas agricultural industries.
Standard 3.2 Associate various Career Development Events (CDEs) with their corresponding Agricultural Pathway.	
Performance Indicators	
3.2.1	Identify Career Development Events that support the Agribusiness Systems Pathway (Ag. Communications, Farm and Agribusiness Management, Auctioneering)
3.2.2	Identify Career Development Events that support the Agriculture Power, Structural & Technical Systems Pathway (Agricultural Technology and Mechanical Systems, Agricultural Electricity)

3.2.3	Identify Career Development Events that support the Animal Systems Pathway (Dairy Cattle Evaluation, Horse, Livestock, Shooting Sports, Poultry, Veterinary Science, Wildlife Management)
3.2.4	Identify Career Development Events that support the Food Products and Processing Systems Pathway (Food Science, Meats Evaluation, Milk Quality and Products)
3.2.5	Identify Career Development Events that support the Plant Systems Pathway (Agronomy, Floriculture, Forestry, Land Judging, Nursery/Landscaping, Turf Grass Management)
Standard 3.3 Plan and develop supervised agricultural experiences.	
Performance Indicators	
3.3.1	Compare and contrast types of Supervised Agricultural Experiences (Entrepreneurship SAEs, Placement SAEs, Research SAEs, School-based SAEs, Exploratory SAEs).
3.3.2	Determine appropriate FFA proficiency awards for each SAE type.
3.3.3	Design, implement, and document personal SAE projects.
3.3.4	Identify the steps, skills acquired, and financial information in those personal SAE projects.
3.3.5	Connect SAE experiences to career goals in Arkansas agriculture.
3.3.6	Evaluate SAEs to determine FFA degree eligibility requirements.
3.3.7	Demonstrate employability skills, including work ethic, timeliness, and communication.
Domain 4 Analyze the development and organization of the agriculture industry	
Standard 4.1 Analyze agricultural impact.	
Performance Indicators	
4.1.1	Analyze major agricultural milestones and their impact on modern life.
4.1.2	Describe the eight major branches of agriculture.
4.1.3	Differentiate between agricultural products and byproducts.

4.1.4	Examine agricultural imports and exports.
4.1.5	Compare Arkansas agriculture to other regions.

Domain 5
Introduction to Agribusiness Systems

Standard 5.1 Analyze the economic significance and business structures of Arkansas agribusiness.	
Performance Indicators	
5.1.1	Examine Arkansas's role as a national leader in the production of commodities such as rice, poultry, and cotton, and evaluate the economic impact on the state.
5.1.2	Research major Arkansas agribusiness companies, such as Tyson Foods and Riceland Foods, and their contributions to the agricultural supply chain.
5.1.3	Compare different types of business ownership structures, including sole proprietorships, partnerships, and cooperatives, and explain their application in agriculture.
5.1.4	Evaluate entrepreneurship opportunities and assess the characteristics of successful agricultural entrepreneurs in Arkansas.
Standard 5.2 Apply basic financial and marketing principles to agricultural contexts.	
Performance Indicators	
5.2.1	Explain fundamental economic principles like supply and demand using examples from Arkansas agricultural commodities.
5.2.2	Set up and maintain financial records for a simulated agricultural enterprise, distinguishing between income and expenses.
5.2.3	Identify different marketing channels for agricultural products and research value-added agriculture opportunities in Arkansas.
5.2.4	Design promotional materials, such as brochures or social media posts, for agricultural products or services.
Standard 5.3 Apply human resource management and risk mitigation strategies to agricultural enterprises.	
Performance Indicators	
5.3.1	Identify the basic functions of human resource management in agricultural businesses, including recruitment, training, and employee compensation.

5.3.2	Explain sources of risk in agricultural businesses, such as weather conditions, price fluctuations, equipment breakdown, and pest damage.
5.3.3	Identify the components of a cash budget for an agricultural enterprise, including anticipated revenue, production costs, overhead costs, and profit.
5.3.4	Summarize the characteristics of different credit instruments available to agricultural producers, such as operating loans, lines of credit, and equipment financing.
Domain 6 Introduction to Agriculture Power, Structural and Technical Systems	
Standard 6.1 Demonstrate safe practices and fundamental skills in agricultural mechanics.	
Performance Indicators	
6.1.1	Follow all safety procedures and regulations, and identify and use appropriate personal protective equipment (PPE) for various tasks.
6.1.2	Describe the safe use of hand and power tools for a variety of agricultural mechanics and fabrication tasks.
6.1.3	Interpret technical drawings, blueprints, and welding symbols to plan and execute fabrication projects.
6.1.4	Demonstrate proper project management techniques, including material selection, cost estimation, and record keeping.
Standard 6.2 Understand and apply principles of engines, power systems, and precision technologies.	
Performance Indicators	
6.2.1	Identify the components of internal combustion engines, comparing and contrasting two-cycle, four-cycle, and electric motors.
6.2.2	Examine how to apply surveying techniques to calculate land area and use geospatial technologies like GIS and GPS for precision agriculture.
6.2.3	Research and categorize computer technologies, including robotics and CNC machinery, that are used to increase efficiency in agricultural systems.
6.2.4	Apply electrical principles to agricultural power systems and equipment.

Standard 6.3 Discuss metal and structural fabrication processes for agricultural applications.	
Performance Indicators	
6.3.1	Compare properties of different metals and select appropriate materials for specific applications based on factors like environmental conditions and load requirements.
6.3.2	Discuss fabrication techniques, including Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and oxy-acetylene cutting.
6.3.3	Investigate the fabrication and repair of agricultural structures and equipment, including steel framing systems and containment structures.
6.3.4	Evaluate the quality of welds and constructed systems using visual inspection and testing methods.
Domain 7 Introduction to Animal Systems	
Standard 7.1 Explore the historical and economic impact of animal systems.	
Performance Indicators	
7.1.1	Investigate how and why humans domesticated different animals throughout history and describe their various roles in human society.
7.1.2	Determine the economic impact of animal industries in Arkansas.
Standard 7.2 Describe fundamental principles of animal care and management.	
Performance Indicators	
7.2.1	Identify basic anatomical structures and physiological systems in animals, including the circulatory, respiratory, digestive, reproductive, and nervous systems.
7.2.2	Evaluate animal health indicators and basic care requirements.
7.2.3	Summarize the stages of animal reproduction and identify common health issues.
7.5.4	Identify appropriate housing and environmental needs for common animal species.
7.5.5	Demonstrate basic safe animal handling techniques.

Standard 7.3 Analyze nutritional requirements and feeding practices for animals.	
Performance Indicators	
7.3.1	Identify essential nutrients required for animal health and explain each nutrient's role in growth, maintenance, and performance.
7.3.2	Compare and contrast common types of feedstuffs and evaluate their general quality and nutritional value.
7.3.3	Identify tools, equipment, and technology used to meet animal nutrition needs and ensure a safe, abundant food supply.
Standard 7.4 Define animal welfare and identify the basic needs of animals.	
Performance Indicators	
7.4.1	Define animal welfare and animal rights.
7.4.2	Explain basic responsibilities of animal ownership and management.
7.4.3	Identify common ethical issues in animal science and describe opposing viewpoints related to animal rights and welfare.
Domain 8 Introduction to Food Products and Processing Systems	
Standard 8.1 Develop and implement procedures to ensure safety, sanitation, and quality in food product and processing facilities.	
Performance Indicators	
8.1.1	Summarize the purposes and objectives of safety programs in food products and processing facilities.
8.1.2	Identify common equipment used in food products and processing systems (packaging, mixing, cooling, heating, preservation) and describe their functions.
8.1.3	Identify hazards associated with food products and processing (physical, chemical, and biological).
8.1.4	Identify cross-contamination hazards associated with food products and processing (waterborne, airborne, and personnel).
8.1.5	Summarize the purposes of food storage procedures (first in/first out, temperature regulation, monitoring).

Standard 8.2 Apply principles of nutrition, biology, microbiology, chemistry, and human behavior to the development of food products.	
Performance Indicators	
8.2.1	Summarize properties of common food constituents (proteins, carbohydrates, fats, vitamins, minerals).
8.2.2	Describe the basic chemical makeup of different types of food.
8.2.3	Identify common food additives and their properties (preservatives, antioxidants, buffers, stabilizers, colors, flavors).
8.2.4	Explain the importance of food labeling to the consumer.
Standard 8.3 Explain the scope of the food industry and the historical and current developments of food product and processing.	
Performance Indicators	
8.3.1	Describe the components of the food products and processing industry (processing, distribution, byproducts).
8.3.2	Summarize examples of policy and legislation that affect food products and processing systems in the United States and internationally (labeling, GMOs, biosecurity, food system policy, dietary guidelines).
8.3.3	Summarize the purposes of organizations that influence or regulate the food products and processing industry.
8.3.4	Describe what sustainability is within the food industry.
Domain 9 Introduction to Plant Systems	
Standard 9.1 Analyze the importance of plants in meeting human needs and their environmental relationships in Arkansas.	
Performance Indicators	
9.1.1	Investigate the roles of cultivated plants in meeting societal needs, such as food, fiber, fuel, and aesthetic purposes.
9.1.2	Distinguish between the psychological and physiological benefits of plants on human health and well-being.
9.1.3	Examine current issues and trends affecting plant science professionals in Arkansas and regional industries

Standard 9.2 Apply knowledge of plant anatomy and physiology to plant growth and development.	
Performance Indicators	
9.2.1	Research and summarize leaf morphology and the function of leaves in photosynthesis.
9.2.2	Identify and summarize the components of flowers, their functions, and the functions of flower parts in reproduction.
9.2.3	Compare and contrast the effects of transpiration, translocation, and assimilation on plant growth.
9.2.4	Analyze the stages of sexual reproductive development in plants.
9.2.5	Compare the life cycles of annual, biennial, and perennial plants.
9.2.6	Identify the three major nutrients found in fertilizer necessary for plant growth (N, P, K)
Standard 9.3 Explore basic plant production practices used in Arkansas agriculture.	
Performance Indicators	
9.3.1	Evaluate the significance of hydroponics and aquaponics technology as it relates to sustainable practices.
9.3.2	Compare and contrast production systems and techniques utilized in hydroponics and aquaponics, including structures, equipment, and methods.
9.3.3	Research and summarize production methods focused on sustainable soil management, including crop rotation, companion planting, and cover crops.
Domain 10 Introduction to Biotechnology	
Standard 10.1 Explain the historical timeline of agricultural biotechnology.	
Performance Indicators	
10.1.1	Identify key innovations and historical milestones in agricultural biotechnology.
10.1.2	Describe the benefits and risks of biotechnology compared with alternative approaches to improving agriculture, including traditional breeding methods.

10.1.3	Summarize the role and scope of biotechnology regulatory agencies at local, state, national, and international levels.
10.1.4	Identify the emergence, evolution, and implications of bioethics associated with biotechnology in agriculture.
10.1.5	Identify public perceptions of biotechnology in agriculture, including social and cultural issues that influence acceptance and adoption.
Standard 10.2 Summarize the relationship between biological structures and their specific functions within agricultural systems.	
Performance Indicators	
10.2.1	Differentiate types of organisms by their physical and biological properties, including plant and animal tissue, cell cultures, and microbes.
10.2.2	Identify the tools and techniques used to extract and purify DNA and RNA in biotechnology applications.
10.2.3	Compare and contrast proteins, enzymes, and antibodies and their relevant uses in agricultural microbiology.
10.2.4	Summarize reasons for detecting microbes in agricultural and food production systems.
10.2.5	Describe enzymes, the changes they cause, and the physical and chemical parameters that affect enzymatic reactions in food and agriculture.
Standard 10.3 Describe how biotechnology is used in plant and animal science.	
Performance Indicators	
10.3.1	Identify foods produced through the use of biotechnology to change the chemical properties of food for preservation, flavor enhancement, or nutritional improvement.
10.3.2	Explain the need for bioproducts such as cellulosic bioenergy, bioplastics, biofoams, and biofuels in sustainable agriculture and manufacturing.
10.3.3	Describe the consequences of agricultural practices on natural populations and identify ways biotechnology can address environmental challenges.
10.3.4	Identify the aims and techniques involved in the selective plant-breeding process and recognize its importance in crop improvement.

Domain 11 Introduction to Precision Agriculture	
Standard 11.1 Define precision agriculture and analyze its impact on modern farming.	
Performance Indicators	
11.1.1	Define precision agriculture.
11.1.2	Explain how precision agriculture differs from traditional farming methods.
11.1.3	Identify real-world examples of precision agriculture technologies used on local or regional farms.
11.1.4	Describe how precision agriculture helps farmers make better decisions using data and information.
Standard 11.2 Examine technologies used in precision agriculture systems.	
Performance Indicators	
11.2.1	Identify at least five technologies used in precision agriculture (such as GPS/GNSS, drones, and yield monitors).
11.2.2	Explain how GPS and mapping technologies help farmers manage their fields.
11.2.3	Describe how drones and remote sensing are used to monitor crop health.
11.2.4	Investigate how farmers collect and use data to improve crop production.
Standard 11.3 Evaluate the benefits of precision agriculture for farmers, consumers, and the environment.	
Performance Indicators	
11.3.1	Explain how precision agriculture helps farmers save money by reducing input waste
11.3.2	Describe environmental benefits of precision agriculture including reduced chemical runoff and improved resource conservation.

11.3.3	Analyze how precision agriculture helps farmers produce more food to feed a growing population.
11.3.4	Explore career pathways in agricultural technology and precision agriculture.

Contributors

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