WORLD AGRICULTURAL SCIENCE AND TECHNOLOGY

#01069

Description

A course designed to introduce students to global agriculture. This course also includes agricultural career development, leadership, communications, and personal finance.

Note: This course can be taught for Agricultural Education credit only.

Grade 10-12
½ or 1 credit
Max Credit = 1

Standard 1	AGRICULTURE, FOOD, & NATURAL RESOURCES (AFNR) CLUSTER SKILLS	
Topic 1.1	*Analyze how issues, trends, technologies, and public policies impact systems in the Agriculture, Food, & Natural Resources Career Cluster.*	
	Student Competencies	
1.1.1	**RESEARCH, EXAMINE, AND DISCUSS ISSUES AND TRENDS THAT IMPACT AFNR SYSTEMS ON LOCAL, STATE, NATIONAL, AND GLOBAL LEVELS.**	
	1.1.1.1	Examine historical and current data to identify issues impacting AFNR systems.
	1.1.1.2	Research and summarize trends impacting AFNR systems.
	1.1.1.3	Analyze and summarize AFNR issues and their impact on local, state, national, and global levels.
	1.1.1.4	Analyze current trends in AFNR systems and predict their impact on local, state, national, and global levels.
	1.1.1.5	Evaluate and explain AFNR issues and their impacts to audiences with limited AFNR knowledge.
	1.1.1.6	Evaluate and explain emerging trends and the opportunities they may create within the AFNR systems.
1.1.2	**EXAMINE TECHNOLOGIES AND ANALYZE THEIR IMPACT ON AFNR SYSTEMS.**	
	1.1.2.1	Research technologies used in AFNR systems.
	1.1.2.2	Compare and contrast AFNR systems before and after the integration of technology.
	1.1.2.3	Apply appropriate use of technologies in AFNR workplace scenarios.
	1.1.2.4	Analyze how technology is used in AFNR systems to maximize productivity.
	1.1.2.5	Solve problems in AFNR workplaces or scenarios using technology.
	1.1.2.6	Evaluate the importance of technology use and how it impacts AFNR systems.
1.1.3	**IDENTIFY PUBLIC POLICIES AND EXAMINE THEIR IMPACT ON AFNR SYSTEMS.**	
	1.1.3.1	Summarize public policies affecting AFNR systems.
	1.1.3.2	Identify influential historical and current public policies that impact AFNR systems.
	1.1.3.3	Analyze and assess at least two public policies that impact each AFNR system.
	1.1.3.4	Create and propose a hypothetical policy that will impact current AFNR systems.
	1.1.3.5	Evaluate a public policy within AFNR systems and defend or challenge it.
	1.1.3.6	Create a plan for implementing a new public policy that will positively impact AFNR systems.
Topic 1.2	*Evaluate the nature and scope of the Agriculture, Food, & Natural Resources Career Cluster and the role of agriculture, food, and natural resources (AFNR) in society and the economy.*	
	Student Competencies	
1.2.1	**RESEARCH AND USE GEOGRAPHIC AND ECONOMIC DATA TO SOLVE PROBLEMS IN AFNR SYSTEMS.**	
	1.2.1.1	Research and describe different types of geographic data used in AFNR systems.

		1.2.1.2	Identify and examine economic data related to AFNR systems (e.g., commodity markets, food marketing, food, and nutritional assistance programs, etc.).
		1.2.1.3	Analyze and interpret AFNR related geographic data using a variety of systems and technologies (e.g., GIS, GPS, etc.).
	1.2.2		**EXAMINE THE COMPONENTS OF THE AFNR SYSTEMS AND ASSESS THEIR IMPACT ON THE LOCAL, STATE, NATIONAL, AND GLOBAL SOCIETY AND ECONOMY.**
		1.2.2.1	Identify and summarize the components within AFNR systems (e.g., Animal Systems: health, nutrition, genetics, etc.; Natural Resources Systems: soil, water, etc.).
		1.2.2.2	Define and summarize societies on local, state, national, and global levels and describe how they relate to AFNR systems.
		1.2.2.3	Examine and summarize the components of the agricultural economy (e.g., environmental, crops, livestock, etc.).
		1.2.2.4	Assess components within AFNR systems and analyze relationships between systems.
		1.2.2.5	Assess how people within societies on local, state, national, and global levels interact with AFNR systems on daily, monthly, or yearly basis.
		1.2.2.6	Assess the economic impact of an AFNR system on a local, state, national, and global level.
		1.2.2.7	Devise and implement a strategy for explaining components of AFNR systems to audiences with limited knowledge.
		1.2.2.8	Evaluate how society traditions, customs, or policies have resulted from practices with AFNR systems.
		1.2.2.9	Evaluate how positive or negative changes in the local, state, national, or global economy impacts AFNR systems.
Topic 1.3			*Examine and summarize the importance of health, safety, and environmental management systems in AFNR workplaces.*
			Student Competencies
	1.3.1		**IDENTIFY AND EXPLAIN THE IMPLICATIONS OF REQUIRED REGULATIONS TO MAINTAIN AND IMPROVE SAFETY, HEALTH, AND ENVIRONMENTAL MANAGEMENT SYSTEMS.**
		1.3.1.1	Research and explain the implications of regulatory, safety, and health standards on AFNR systems (e.g., SDS, bioterrorism, etc.)
		1.3.1.2	Summarize the importance of safety, health, and environmental management in the workplace.
		1.3.1.3	Execute health, safety, and environmental procedures to comply with regulatory and safety standards.
	1.3.4		**USE APPROPRIATE PROTECTIVE EQUIPMENT AND DEMONSTRATE SAFE AND PROPER USE OF AFNR TOOLS AND EQUIPMENT.**
		1.3.4.1	Identify and differentiate the appropriate protective equipment for the safe use and operation of specific tools and equipment (e.g. PPE, etc.).
		1.3.4.2	Identify standard tools, equipment and safety procedures related to AFNR tasks.

	1.3.4.3	Read and interpret operating instructions related to operation, storage and maintenance of tools and equipment related AFNR tasks.
	1.3.4.4	Analyze and demonstrate adherence to protective equipment requirements when using various AFNR tools and equipment.
	1.3.4.5	Complete the set up and adjustment for tools and equipment related to AFNR tasks.
	1.3.4.6	Assess and demonstrate appropriate operation, storage, and maintenance techniques for AFNR tools and equipment.
	1.3.4.7	Design and implement plans to ensure the use of appropriate protective equipment when using various AFNR tools and equipment.
	1.3.4.8	Evaluate and select appropriate tools and equipment to complete AFNR tasks.
	1.3.4.9	Devise and implement operation, storage, and maintenance plans or schedules for AFNR tools and equipment.
Topic 1.4	*Demonstrate stewardship of natural resources in AFNR activities.*	
	Student Competencies	
1.4.1	**IDENTIFY AND IMPLEMENT PRACTICES TO STEWARD NATURAL RESOURCES IN DIFFERENT AFNR SYSTEMS.**	
	1.4.1.1	Define stewardship of natural resources and distinguish how it connects to AFNR systems.
	1.4.1.2	Read and interpret the definition of sustainability and summarize how it relates to AFNR activities.
	1.4.1.3	Analyze available practices to steward natural resources in AFNR systems (e.g., wildlife and land conservation, soil and water practices, ecosystem management, etc.).
	1.4.1.4	Analyze and assess sustainability practices that can be applied in AFNR systems (e.g., energy efficiency, recycle/reuse/repurpose, green resources, etc.).
	1.4.1.5	Devise strategies for stewarding natural resources at home and within community.
	1.4.1.6	Evaluate sustainability policies and plans and prepare summary of potential improvements for AFNR businesses or organizations.
1.4.2	**ASSESS AND EXPLAIN THE NATURAL RESOURCE RELATED TRENDS, TECHNOLOGIES, AND POLICIES THAT IMPACT AFNR SYSTEMS.**	
	1.4.2.1	Research and examine historical and current natural resources trends and technologies.
	1.4.2.2	Research and summarize influential historical and current natural resources policies that impact AFNR systems.
	1.4.2.3	Analyze natural resources trends and technologies and explain how they impact AFNR systems (e.g., climate change, green technologies, water resources, etc.).
	1.4.2.4	Create and defend a hypothetical natural resources policy that will impact current AFNR systems (e.g., for water resources, land use, air quality, etc.).
	1.4.2.5	Defend or challenge natural resources trends and technologies based upon an assessment of their impact on AFNR systems.

	1.4.2.6	Design and implement strategies for implementing a new natural resources policy that will positively impact AFNR systems.
Topic 1.5		*Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food, & Natural Resources career pathways.*
		Student Competencies
	1.5.1	**EVALUATE AND IMPLEMENT THE STEPS AND REQUIREMENTS TO PURSUE A CAREER OPPORTUNITY IN EACH OF THE AFNR CAREER PATHWAYS (E.G., GOALS, DEGREES, CERTIFICATIONS, RESUMES, COVER LETTER, PORTFOLIOS, INTERVIEWS, ETC.).**
	1.5.1.1	Identify and summarize the steps to pursue a career in an AFNR pathway (e.g., self-assessment, set goals, etc.).
	1.5.1.2	Examine the educational, training, and experiential requirements to pursue a career in an AFNR pathway (e.g., degrees, certifications, training, internships, etc.).
	1.5.1.3	Research and summarize specific tools (e.g., resumes, portfolios, cover letters, etc.) and processes (e.g., interviews, applications, etc.) needed to pursue a career in an AFNR pathway.
	1.5.1.4	Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway.
	1.5.1.5	Analyze personal skillset and create a plan for obtaining the required education, training, and experiences to obtain a career in an AFNR pathway.
	1.5.1.6	Assess personal goals, experiences, education, and skillsets and organize them to produce the appropriate tools and develop the skills to effectively communicate about one's qualifications for an AFNR career.
	1.5.2	**EXAMINE AND CHOOSE CAREER OPPORTUNITIES THAT ARE MATCHED TO PERSONAL SKILLS, TALENTS, AND CAREER GOALS IN AN AFNR PATHWAY OF INTEREST.**
	1.5.2.1	Examine and categorize careers in each of the AFNR pathways.
	1.5.2.2	Research and describe careers in each of the AFNR pathways and choose potential careers connecting to personal interests and skills.
	1.5.2.3	Assess personal skills and align them with potential career opportunities in AFNR pathways.
Topic 1.6		*Analyze the interaction among AFNR systems in the production, processing, and management of food, fiber, and fuel and the sustainable use of natural resources.*
		Student Competencies
	1.6.1	**EXAMINE AND EXPLAIN FOUNDATIONAL CYCLES AND SYSTEMS OF AFNR.**
	1.6.1.1	Research and explain the foundational cycles in AFNR (e.g., water cycle, nutrient cycle, carbon cycle, etc.).
	1.6.1.2	Examine and describe examples of systems within AFNR (e.g., sustainability, gate-to-plate, etc.).
	1.6.1.3	Analyze and explain how foundational cycles affect production, processing, and management of food, fiber, and fuel.

		1.6.1.4	Analyze AFNR systems and determine their impact on producing and processing food, fiber, and fuel.
		1.6.1.5	Teach others about the impact of foundational cycles within AFNR systems.
		1.6.1.6	Evaluate AFNR systems and predict how the systems may change or adapt in the future of food, fiber, and fuel production based on current trends and data.
	1.6.2	**ANALYZE AND EXPLAIN THE CONNECTION AND RELATIONSHIPS BETWEEN DIFFERENT AFNR SYSTEMS ON A NATIONAL AND GLOBAL LEVEL.**	
		1.6.2.1	Summarize how AFNR systems connect and relate on a national and global level (e.g., soil, water, economic, etc.).
		1.6.2.2	Examine and summarize changes that happen in AFNR systems on a national and global level (e.g., using less irrigation water, reduction of inputs, etc.).
		1.6.2.3	Analyze differences between AFNR systems on a national and global scale.
		1.6.2.4	Analyze the connections and relationships impacted when there is a change in an AFNR system on a national and global level.
		1.6.2.5	Evaluate how AFNR systems impact each other on a national and global level.
		1.6.2.6	Evaluate how changes in one AFNR system can benefit cost components of other systems on a national and global level.

Standard 3	**ANIMAL SYSTEMS**		
Topic 3.1	*Analyze historic and current trends impacting the animal systems industry.*		
Student Competencies			
	3.1.1	**EVALUATE THE DEVELOPMENT AND IMPLICATIONS OF ANIMAL ORIGIN, DOMESTICATION, AND DISTRIBUTION ON PRODUCTION PRACTICES AND THE ENVIRONMENT.**	
		3.1.1.1	Identify and summarize the origin, significance, distribution, and domestication of different animal species.
		3.1.1.2	Research and summarize major components of animal systems (e.g., livestock, companion animal, etc.).
		3.1.1.3	Evaluate and describe characteristics of animals that developed in response to the animal's environment and led to their domestication.
		3.1.1.4	Describe the historical and scientific developments of different animal industries and summarize the products, services, and careers associated with each.
		3.1.1.5	Evaluate the implications of animal adaptations on production practices and the environment.
		3.1.1.6	Predict trends and implications of future developments within different animal industries on production practices and the environment.

	3.1.2	**ASSESS AND SELECT ANIMAL PRODUCTION METHODS FOR USE IN ANIMAL SYSTEMS BASED UPON THEIR EFFECTIVENESS AND IMPACTS.**	
		3.1.2.1	Identify and categorize terms and methods related to animal production (e.g., sustainable, conventional, humanely raised, natural, organic, etc.).
		3.1.2.2	Research and examine marketing methods for animal products and services (e.g., conventional, niche markets, locally grown, etc.).
	3.1.3	**ANALYZE AND APPLY LAWS AND SUSTAINABLE PRACTICES TO ANIMAL AGRICULTURE FROM A GLOBAL PERSPECTIVE.**	
		3.1.3.1	Distinguish between the types of laws pertaining to animal systems.
		3.1.3.2	Research and summarize sustainability in animal systems.
		3.1.3.3	Analyze the structure of laws governing animal industries, international trade, and animal production policies.
		3.1.3.4	Analyze the local and global impact of sustainable animal agriculture practices on human and environmental systems.
		3.1.3.5	Evaluate the impact of laws pertaining to animal agriculture (e.g., pros, cons, effect on individuals, effect on businesses, etc.) and assess the compliance of production practices with established regulations.
		3.1.3.6	Select, evaluate and defend the use of sustainable practices in animal agriculture.

Standard 4	**BIOTECHNOLOGY SYSTEMS**	
Topic 4.1	*Assess factors that have influenced the evolution of biotechnology in agriculture (e.g., historical events, societal trends, ethical, and legal implications, etc.).*	
Student Competencies		
4.1.2	**EVALUATE THE SCOPE AND IMPLICATIONS OF REGULATORY AGENCIES ON APPLICATIONS OF BIOTECHNOLOGY IN AGRICULTURE AND PROTECTION OF PUBLIC INTERESTS (E.G., HEALTH, SAFETY, ENVIRONMENTAL ISSUES, ETC.).**	
	4.1.2.1	Compare and contrast differences between regulatory systems worldwide.
	4.1.2.2	Research and document major regulatory issues related to biotechnology in agriculture.
	4.1.2.3	Explain the relationship between regulatory agencies and the protection of public interests such as health, safety, and the environment.
4.1.3	**ANALYZE THE RELATIONSHIP AND IMPLICATIONS OF BIOETHICS, LAWS, AND PUBLIC PERCEPTIONS ON APPLICATIONS OF BIOTECHNOLOGY IN AGRICULTURE (E.G., ETHICAL, LEGAL, SOCIAL, CULTURAL ISSUES).**	
	4.1.3.1	Research and summarize the emergence, evolution, and implications of bioethics associated with biotechnology in agriculture.

	4.1.3.2	Research and summarize legal issues related to biotechnology in agriculture (e.g., protection of intellectual property through patents, copyright, trademarks, etc.).
	4.1.3.3	Research and summarize public perceptions of biotechnology in agriculture (e.g., social and cultural issues).
	4.1.3.4	Analyze the implications bioethics may have on future advancements in AFNR.
	4.1.3.5	Determine the significance and impacts of legal issues related to biotechnology in agriculture.
	4.1.3.6	Analyze the impact of public perceptions on the application of biotechnology in different AFNR systems.

Standard 6	FOOD PRODUCTS AND PROCESSING SYSTEMS	
Topic 6.4	*Explain the scope of the food industry and the historical and current developments of food product and processing.*	
Student Competencies		
6.4.1	**EXAMINE THE SCOPE OF THE FOOD INDUSTRY BY EVALUATING LOCAL AND GLOBAL POLICIES, TRENDS, AND CUSTOMS FOR FOOD PRODUCTION.**	
	6.4.1.1	Research and summarize examples of policy and legislation that affect food products and processing systems in the United States and around the world (e.g., labeling, GMOs, biosecurity, food system policy, dietary guidelines, etc.).
	6.4.1.2	Examine the impact of consumer trends on food products and processing practices (e.g., health and nutrition, organic, information about food products, local food movements, farm-to-fork supply chains, food system transparency, etc.).
	6.4.1.3	Compare and contrast cultural differences regarding food products and processing practices.
	6.4.1.4	Analyze the similarities and differences amongst policies and legislation that affect the food products and processing system in the U.S. or around the world.
	6.4.1.5	Construct and implement methods to obtain data on food consumer trends in a specific market.
	6.4.1.6	Analyze food production and distribution outcomes based on cultural customs.
	6.4.1.7	Articulate and defend a personal point of view on policies and legislation that affect the food products and processing system in the U.S. or around the world.
	6.4.1.8	Devise and implement a strategy to create food products that meet a specific consumer trend in a specific market.
	6.4.1.9	Propose and implement culturally sensitive food processing and distribution practices.

	6.4.2	**EVALUATE THE SIGNIFICANCE AND IMPLICATIONS OF CHANGES AND TRENDS IN THE FOOD PRODUCTS AND PROCESSING INDUSTRY IN THE LOCAL AND GLOBAL FOOD SYSTEMS.**
	6.4.2.1	Describe and explain the components of the food products and processing industry (e.g., processing, distribution, byproducts, etc.).
	6.4.2.2	Identify and explain environmental and safety concerns about the food supply.
	6.4.2.3	Research and describe current and emerging technologies related to food products and processing (e.g., high pressure processing of foods, automation, biotechnology, etc.).
	6.4.2.4	Analyze & document significant changes & trends in the food products/processing industry.
	6.4.2.5	Research & summarize current issues related to the safety and environmental concerns about foods and food processing (e.g., GMOs, irradiation, microorganisms, contamination, etc.).
	6.4.2.6	Evaluate desirable and undesirable outcomes of emerging technologies used in the food products and processing systems.
	6.4.2.7	Predict & defend upcoming changes & trends in the food products and processing industry.
	6.4.2.8	Examine and respond to consumer concerns about the environment and safety of the food supply using accurate information regarding food products and processing systems and practices.
	6.4.2.9	Research and evaluate the feasibility of implementing a current or emerging technology to improve a current food product or process used in a facility.
	6.4.3	**IDENTIFY AND EXPLAIN THE PURPOSE OF INDUSTRY ORGANIZATIONS, GROUPS, AND REGULATORY AGENCIES THAT INFLUENCE THE LOCAL AND GLOBAL FOOD SYSTEMS.**
	6.4.3.1	Examine and summarize the purposes of organizations that influence or regulate the food products and processing industry.
	6.4.3.2	Examine and describe the importance and usage of regulatory oversight of food safety and security in food products and processing (e.g., internationally, nationally, state, and local).
	6.4.3.3	Evaluate the changes in the food products and processing industry brought about by industry organizations or regulatory agencies.
	6.4.3.4	Assess and summarize the application of industry standards in the food products and processing industry.
	6.4.3.5	Construct and implement methods to obtain data about organizations, groups, and regulatory agencies that affect the food products and processing industry.
	6.4.3.6	Construct and implement plans that ensure adherence to industry standards for food products and processing facilities.

Standard 7	NATURAL RESOURCE SYSTEMS	
Topic 7.2	*Analyze the interrelationships between natural resources and humans.*	
	Student Competencies	
	7.2.3	**ANALYZE HOW MODERN PERCEPTIONS OF NATURAL RESOURCE MANAGEMENT, PROTECTION, ENHANCEMENT, & IMPROVEMENT CHANGE & DEVELOP OVER TIME.**
	7.2.3.1	Summarize and categorize the different social considerations in regards to the use of natural resources (e.g., public vs. private, laws and regulations, economics, green technology, etc.).
	7.2.3.2	Research and assess how historical figures played a prominent role in shaping how natural resources are viewed and used today (e.g., Aldo Leopold, Teddy Roosevelt, John Muir, Rachel Carson, Gaylord Nelson, etc.).
	7.2.3.3	Research how technology has affected the use and views of natural resources.
	7.2.4	**EXAMINE AND EXPLAIN HOW ECONOMICS AFFECTS THE USE OF NATURAL RESOURCES.**
	7.2.4.1	Compare and contrast how the economic value of a natural resource affects its availability.
	7.2.4.2	Research the impact of the use of natural resources on local, state and national economies (e.g., outdoor recreation, energy production, preservation, etc.).
	7.2.4.3	Compare and contrast the economic impact of green technology and alternative energy.
	7.2.4.4	Assess whether economic value increases or decreases the conservation, protection, improvement, and enhancement of natural resources.
	7.2.4.5	Assess the importance of the use of natural resources on local, state, and national economies.
	7.2.4.6	Analyze and document how the adoption of green technology and/or alternative energy affected a local, state, or national economy.
	7.2.4.7	Devise a plan to improve the conservation, protection, improvement, and enhancement of natural resources based on economic value and practices.
	7.2.4.8	Anticipate and predict how changes to the availability of natural resources because of human activity may impact a local, state, and national economy.
	7.2.4.9	Anticipate and predict the economic impact green technology and alternative energy.
	7.2.5	**COMMUNICATE INFORMATION TO THE PUBLIC REGARDING TOPICS RELATED TO THE MANAGEMENT, PROTECTION, ENHANCEMENT, AND IMPROVEMENT OF NATURAL RESOURCES.**
	7.2.5.1	Examine and describe ways in which a message regarding natural resources may be communicated to the public through standard media sources (e.g., press, radio, TV, public appearances, etc.).
	7.2.5.2	Research and summarize how social media and the Internet have changed how people perceive and utilize natural resources (e.g., greater awareness of conservation issues, calls to action, etc.).
	7.2.5.3	Examine and describe how communication can be used to influence behavior, call people to action, and instill a sense of civic behavior related to the conservation, management, enhancement, and improvement of natural resources.

Career Ready Practices (CRP)

FFA & SUPERVISED AGRICULTURAL EXPERIENCE

CRP 1	Act as a responsible and contributing citizen and employee.
CRP 2	Apply appropriate academic and technical skills.
CRP 3	Attend to personal health and financial well-being.
CRP 4	Communicate clearly, effectively, and with reason.
CRP 5	Consider the environmental, social, and economic impacts of decisions.
CRP 6	Demonstrate creativity and innovation.
CRP 7	Employ valid and reliable research strategies.
CRP 8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP 9	Model integrity, ethical leadership, and effective management.
CRP 10	Plan education and career path aligned to personal goals.
CRP 11	Use technology to enhance productivity.
CRP 12	Work productively in teams while using cultural/global competence.