



# 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.*

*½ to 1 credit*

*Max credit=1*

**Grades 10-12**

<b>Standard 1</b>	<b><i>AGRICULTURE, FOOD, &amp; NATURAL RESOURCES (AFNR) FOUNDATIONAL PATHWAY SKILLS</i></b>	
<b>Topic 1.1</b>	<b>Research, examine, and discuss issues and trends that impact AFNR systems on local, state, national, and global levels.</b>	
	<b>Student Competencies</b>	
	1.1.4	Predict the impact of current trends in AFNR systems on local, state, national, and global levels.
	1.1.5	Interpret AFNR issues and their impacts to audiences with limited AFNR knowledge.
	1.1.6	Determine the opportunities emerging trends create within the AFNR systems.
<b>Topic 1.2</b>	<b>Examine technologies and analyze their impact on AFNR systems.</b>	
	<b>Student Competencies</b>	
	1.2.4	Analyze how technology is used in AFNR systems to maximize productivity.
	1.2.5	Develop solutions in AFNR workplaces or scenarios using technology.
	1.2.6	Evaluate the importance of technology use and how it impacts AFNR systems.
<b>Topic 1.3</b>	<b>Identify public policies and examine their impact on AFNR systems.</b>	
	<b>Student Competencies</b>	
	1.3.1	Summarize public policies affecting AFNR systems.
	1.3.2	Identify an AFNR problem that could be solved by public policy.
	1.3.3	Analyze at least two public policies that impact AFNR system.
<b>Topic 1.4</b>	<b>Research and use geographic and economic data to solve problems in AFNR systems.</b>	
	<b>Student Competencies</b>	
	1.4.1	Describe different types of geographic data used in AFNR systems.
	1.4.2	Identify economic data related to AFNR systems (e.g., commodity markets, food marketing, food, and nutritional assistance programs, etc.).
	1.4.3	Interpret AFNR related geographic data using a variety of systems and technologies (e.g., GIS, GPS, etc.).
<b>Topic 1.5</b>	<b>Examine the impact of AFNR on the local, state, national, and global society and economy.</b>	
	<b>Student Competencies</b>	
	1.5.1	Identify the components within AFNR systems (e.g., Animal Systems: health, nutrition, genetics, etc.; Natural Resources Systems: soil, water, etc.).
	1.5.2	Describe how cultures on local, state, national, and global levels relate to AFNR systems.
	1.5.3	List the economic elements of the agricultural economy (e.g., environmental, crops, livestock, etc.).
	1.5.4	Examine the impact AFNR systems have on local, state, national, and global society and economy.
	1.5.5	Assess how people on local, state, national, and global levels interact with AFNR systems on a daily, monthly, or yearly basis.

	1.5.6	Assess the economic impact of an AFNR system on a local, state, national, and global level.
	1.5.7	Develop a strategy for explaining the breadth of AFNR systems to audiences with limited AFNR knowledge.
	1.5.8	Evaluate how cultural traditions, customs or policies have resulted from practices with AFNR systems.
	1.5.9	Evaluate how positive or negative changes in the local, state, national or global economy impacts AFNR systems.
<b>Topic 1.6</b>	<b>Identify and explain the implications of required regulations to maintain and improve safety, health, and environmental management systems.</b>	
	<b>Student Competencies</b>	
	1.6.1	Identify implications of regulatory, safety, and health standards on AFNR systems (e.g., SDS, bio-terrorism, etc.)
	1.6.2	Summarize the importance of safety, health, and environmental management in the workplace.
	1.6.3	Explain a health, safety, and environmental procedures to comply with regulatory and safety standards.
	1.6.4	Analyze existing required regulations within an AFNR workplace.
	1.6.5	Evaluate how AFNR organizations and businesses promote improved health, safety, and environmental management.
	1.6.6	Develop methods to evaluate compliance with required safety, health, and environmental management regulations.
<b>Topic 1.10</b>	<b>Identify and implement practices to steward natural resources in different AFNR systems.</b>	
	<b>Student Competencies</b>	
	1.10.1	Illustrate stewardship of natural resources.
	1.10.2	Explain how sustainability relates to AFNR activities.
	1.10.3	Analyze practices to steward natural resources in AFNR systems (e.g., wildlife and land conservation, soil and water practices, ecosystem management, etc.).
	1.10.4	Categorize sustainability practices that can be applied in AFNR systems (e.g., energy efficiency, recycle/reuse/repurpose, green resources, etc.).
	1.10.5	Create strategies for stewarding natural resources at home and within community.
	1.10.6	Recommend sustainability policies and plans for potential improvements for AFNR businesses or organizations.
<b>Topic 1.11</b>	<b>Assess and explain the natural resource related trends, technologies, and policies that impact AFNR systems.</b>	
	<b>Student Competencies</b>	
	1.11.1	Discuss historical and current natural resources trends and technologies.
	1.11.2	Identify current local, state, and federal policies impacting AFNR systems.
	1.11.3	Dissect natural resources trends and technologies impacting AFNR systems (e.g., climate change, green technologies, water resources, etc.).
	1.11.4	Compare natural resources policies impacting current AFNR systems (e.g., for water resources, land use, air quality, etc.).
	1.11.5	Predict emerging natural resource trends and technologies within AFNR systems.
	1.11.6	Propose strategies for implementing a new natural resources policy to positively impact AFNR systems.
<b>Topic 1.12</b>	<b>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.).</b>	
	<b>Student Competencies</b>	

	1.12.1	Identify steps to pursue a career in an AFNR pathway (e.g., self-assessment, set goals, etc.).
	1.12.2	Classify the educational, training, and experiential requirements to pursue a career in an AFNR pathway (e.g., degrees, certifications, training, internships, etc.).
	1.12.3	Describe 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.
<b>Topic 1.13</b>	<b>Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.</b>	
	<b>Student Competencies</b>	
	1.13.1	Describe careers in each of the AFNR pathways.
	1.13.2	Assess how personal skills and align them with potential career opportunities in AFNR pathways.
<b>Topic 1.14</b>	<b>Examine and explain foundational cycles and systems of AFNR.</b>	
	<b>Student Competencies</b>	
	1.14.1	Explain the life cycles in AFNR (e.g., water cycle, nutrient cycle, carbon cycle, reproductive, mechanical, etc.).
	1.14.2	Explain the interactions between various AFNR systems (e.g., sustainability, animal, plant, food, natural resource, agribusiness, power structure and technical, and biotechnology , etc.).
	1.14.3	Analyze how life cycles affect production, processing, and management of food, feed, fiber, and fuel.
	1.14.4	Analyze the impact of producing and processing food, feed, fiber, and fuel within AFNR systems.
	1.14.5	Interpret the impact of life cycles within AFNR systems.
	1.14.6	Predict how AFNR systems may change or adapt in the future of food, feed, fiber, and fuel production based on current trends and data.
<b>Topic 1.15</b>	<b>Recognize the value of a Supervised Agricultural Experience (SAE) as Work-Based Learning.</b>	
	<b>Student Competencies</b>	
	1.15.1	Define Supervised Agricultural Experience (SAE).
	1.15.2	Describe the lifelong learning and career skills that SAEs provide.
	1.15.3	List the types of foundational and immersion SAEs.
	1.15.4	Analyze the value of SAEs.
	1.15.5	Analyze the lifelong learning and career skills that are developed from SAE involvement.
<b>Topic 1.16</b>	<b>Implement the components of a Foundational SAE.</b>	
	<b>Student Competencies</b>	
	1.16.1	Investigate career opportunities based on individual strengths and preferences.
	1.16.2	Identify employability skills that are important in a chosen career field.
	1.16.3	Define record keeping and its relationship to personal financial literacy.
	1.16.4	Define workplace safety and its importance with AFNR.
	1.16.5	Identify issues, trends, technologies, and public policies that impact AFNR systems.
<b>Topic 1.17</b>	<b>Recognize the options within and participate in immersive supervised agricultural experiences.</b>	
	<b>Student Competencies</b>	
	1.17.1	Describe the knowledge and skills required to be successful in a specific AFNR career field.

	1.17.2	Connect record-keeping skills to financial literacy.
	1.17.3	Create a personal immersion SAE plan to develop the knowledge and skills required to be successful in a specific AFNR career field.
	1.17.4	Choose a record-keeping system to demonstrate financial literacy.
<b>Topic 1.18</b>	<b>Analyze the history of the National FFA Organization and how this timeline has allowed the organization to remain relevant.</b>	
	<b>Student Competencies</b>	
	1.18.3	Interpret how the historical events within FFA's history have transitioned the organization to where it is today and where it may go in the future.
<b>Topic 1.22</b>	<b>Evaluate opportunities to develop leadership, citizenship, and career skills.</b>	
	<b>Student Competencies</b>	
	1.22.1	Define leadership and identify leadership skills.
	1.22.2	Define citizenship and identify citizenship skills.
	1.22.3	Identify career skills necessary in today's workplace.
	1.22.4	Identify opportunities available to develop leadership skills.
	1.22.5	Compare and contrast leadership skills and styles.
	1.22.6	Explain how citizenship activities build skills.
	1.22.7	Demonstrate the importance of career skills in a workplace setting.
	1.22.8	Explain how FFA offices, community service, leadership conferences, career development events, leadership development events, and other opportunities build leadership and citizenship skills.
	1.22.9	Evaluate your personal leadership skills and areas of growth related to leadership.
	1.22.10	Evaluate your personal citizenship and areas of growth.
	1.22.11	Evaluate your personal career skills and areas of growth.
	1.22.12	Design a plan to develop your personal leadership skills, including citizenship and career skills.

<b>Standard 2</b>	<b><i>AGRIBUSINESS SYSTEMS</i></b>	
<b>Topic 2.1</b>	<b>Apply economic principles to plan and manage inputs and outputs in an AFNR business.</b>	
	<b>Student Competencies</b>	
	2.1.1	Identify examples of microeconomic principles related to decisions about AFNR business inputs and outputs (e.g., supply, demand and equilibrium, elasticity, diminishing returns, opportunity cost, etc.).
	2.1.2	Identify examples of macroeconomic principles related to AFNR businesses (e.g., Gross Domestic Product, inflation, capital accounts, unemployment rate, etc.).
	2.1.3	Describe different global economic systems (e.g., traditional economic system, command economic system, market economic system, mixed economic system, etc.).
	2.1.4	Apply microeconomic principles to calculate values associated with different inputs and outputs in AFNR businesses (e.g., price, point of equilibrium, opportunity costs, marginal costs, etc.).
	2.1.5	Analyze the relationship between AFNR business and industry outputs and domestic and global macroeconomic trends (e.g., Gross Domestic Product, national income, rate of growth, price levels, etc.).
	2.1.6	Compare and contrast global economic policy and trade impacting AFNR businesses.
	2.1.7	Evaluate strategies using case studies to maximize the efficiency and sustainability of AFNR business inputs and outputs using microeconomic principles.
	2.1.8	Evaluate the impact of the current macroeconomic environment on decisions related to AFNR businesses.
	2.1.9	Recommend how an agribusiness might adapt to changing global economic scenarios or trade regimes.
<b>Topic 2.3</b>	<b>Develop and apply skills to manage an AFNR business in an efficient, legal, and ethical manner.</b>	
	<b>Student Competencies</b>	
	2.3.1	Identify examples of management skills used to organize an AFNR business (e.g., management types, organizational structures, time management techniques, conducting business agreements, etc.).
	2.3.2	Identify local, state, federal, international, and industry regulations that impact the management and operation of AFNR businesses.
	2.3.3	Identify common ethical dilemmas faced by AFNR businesses.
<b>Topic 2.6</b>	<b>Assemble, interpret, and analyze financial information and reports to monitor AFNR business performance and support decision-making (e.g., income statements, balance sheets, cash-flow analysis, inventory reports, break-even analysis, return on investment, taxes, etc.).</b>	
	<b>Student Competencies</b>	
	2.6.1	Compare and contrast the different types of financial reports (e.g., income statements, cash flow statements, equity statements, etc.) and their frequency of use (e.g., daily, weekly, monthly, quarterly, annual) for monitoring AFNR business performance.
	2.6.2	Summarize strategies for tracking, reporting, and managing inventory in AFNR businesses (e.g., spreadsheets, databases, word processing, networked systems, and the Internet, etc.).
	2.6.3	Define and classify different types of taxes that may be paid by AFNR businesses (e.g., income, property, sales, employment, estate, etc.).

<b>Topic 2.9</b>	<b>Analyze characteristics and planning requirements associated with developing business plans for different types of AFNR businesses.</b>	
	<b>Student Competencies</b>	
	2.9.8	Evaluate the successes and failures of AFNR businesses within the global economics system as related to the business ownership structure.
<b>Topic 2.12</b>	<b>Determine the role of markets, trade, competition, and price in relation to an AFNR business sales and marketing plans.</b>	
	<b>Student Competencies</b>	
	2.12.1	Explain markets related to AFNR businesses (e.g. commodity markets, energy markets, etc.).
	2.12.2	Summarize different forms of market competition found in AFNR businesses (e.g., direct competitors, indirect competitors, replacement competitors, etc.).
	2.12.3	Analyze the role of trade and price in the market structure as it relates to AFNR businesses.
	2.12.5	Predict future trends for a specific AFNR product as related to markets, trade, and price (e.g., corn, oil, wheat, etc.).

<b>Standard 3</b>	<b><i>ANIMAL SYSTEMS</i></b>	
<b>Topic 3.1</b>	<b>Evaluate the development and implications of animal origin, domestication, and distribution on production practices and the environment.</b>	
	<b>Student Competencies</b>	
	3.1.4	Analyze the development of a variety of animal industries, technological advancements, research, and engineering practices and how they influenced products, services, and careers.
	3.1.5	Evaluate the implications of animal characteristics on production practices and the environment.
	3.1.6	Evaluate trends (e.g., labor, economic, environmental, etc.) and implications of future developments within different animal industries on production practices and the environment.
<b>Topic 3.3</b>	<b>Analyze laws and sustainable practices that impact animal agriculture from a local, tribal, state, national, and global perspective.</b>	
	<b>Student Competencies</b>	
	3.3.1	Identify the types of laws pertaining to animal production, marketing, and management.
	3.3.3	Analyze the roles of state and federal agencies and how they govern animal industries, international trade, and animal production policies.
	3.3.4	Analyze the local and global impact of sustainable animal agriculture practices on human and environmental systems.
	3.3.5	Evaluate the impact of laws pertaining to animal agriculture (e.g., pros, cons, effect on individuals, effect on businesses, etc.).
<b>Topic 3.5</b>	<b>Analyze procedures to ensure that animal products are safe for consumption.</b>	
	<b>Student Competencies</b>	
	3.5.4	Utilize technology and equipment to perform animal husbandry and welfare procedures and techniques.
	3.5.5	Analyze consumer concerns with animal production practices relative to human health.
	3.5.6	Analyze the impact of animal traceback capabilities on producers and consumers.
	3.5.7	Recommend the use of specific techniques used to perform animal husbandry and welfare procedures.
	3.5.8	Evaluate programs to ensure the safety of animal products for consumption.
	3.5.9	Evaluate the effectiveness of animal tracking systems for a given species.
<b>Topic 3.12</b>	<b>Design and evaluate animal housing, equipment, and handling facilities for the major systems of animal production.</b>	
	<b>Student Competencies</b>	
	3.12.3	Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe, sustainable, and efficient use of the facility.
	3.12.4	Analyze the use of modern equipment, technology, and handling facility procedures to determine if they enhance the safe, economic, and sustainable production of animals.
<b>Topic 3.13</b>	<b>Comply with government regulations and safety standards for facilities used in animal production.</b>	
	<b>Student Competencies</b>	
	3.13.6	Evaluate the impact of laws pertaining to animal systems.



<b>Topic 3.18</b>	<b>Analyze biosecurity measures utilized to protect the welfare of animals and health of humans on a local, state, national, and global level.</b>	
<b>Student Competencies</b>		
	3.18.1	Summarize the importance of biosecurity to the animal industry at multiple levels (e.g., local, state, national, global).
	3.18.2	Identify zoonotic diseases including their historical significance and potential future implications.
	3.18.3	Analyze procedures at the local, state, and national levels to ensure biosecurity of the animal industry.
	3.18.4	Analyze the health risk of different zoonotic diseases to humans and identify prevention methods.
<b>Topic 3.19</b>	<b>Design management practices related to animal agriculture to enhance the environment.</b>	
<b>Student Competencies</b>		
	3.19.1	Describe the effects of animal agriculture on the environment (e.g., waste disposal, carbon footprint, air quality, environmental efficiencies, grazing, improved soil, etc.).
	3.19.2	Assess the effectiveness of methods of reducing the negative effects and maximizing the positive effects of animal agriculture on the environment.

<b>Standard 4</b>	<b><i>BIOTECHNOLOGY SYSTEMS</i></b>	
<b>Topic 4.1</b>	<b>Investigate and explain the relationships in the timeline of developing biotechnology applications and techniques in agriculture (e.g., major innovators, historical developments, potential applications of biotechnology, etc.).</b>	
	<b>Student Competencies</b>	
	4.1.1	Diagram the progression of biotechnology and the evolution of scientific knowledge.
	4.1.2	Identify the benefits and risks of biotechnology compared with alternative approaches to improving agriculture.
<b>Topic 4.2</b>	<b>Evaluate the roles, scope, and implications of regulatory agencies on applications of biotechnology in agriculture and the protection of public interests (e.g., health, safety, environmental issues, etc.).</b>	
	<b>Student Competencies</b>	
	4.2.4	Compare and contrast biotechnology regulatory systems (e.g., local, state, national, international).
	4.2.5	Analyze the impact regulatory issues have on both the agricultural industry and on public acceptance of biotechnology in agriculture.
	4.2.6	Examine factors and data that regulatory agencies use to evaluate the potential risks a new application of biotechnology may pose to health, safety, and the environment.
<b>Topic 4.12</b>	<b>Apply biotechnology principles, techniques, and processes to enhance plant and animal care and production (e.g., selective breeding, pharmaceuticals, biodiversity, etc.).</b>	
	<b>Student Competencies</b>	
	4.12.11	Evaluate the process used to produce pharmaceuticals from transgenic organisms (e.g., hormones for animals, etc.).
	4.12.12	Evaluate whether current threats to biodiversity will have an unsustainable impact on human populations.

<b>Standard 5</b>	<b><i>EDUCATION, COMMUNICATION, AND LEADERSHIP</i></b>	
<b>Topic 5.1</b>	<b>Explore the breadth of opportunities in agricultural education (e.g., using state or national resources, Teach Ag, university program information, professional associations, etc.).</b>	
	<b>Student Competencies</b>	
	5.1.1	Identify various agricultural education careers within and beyond the scope of school-based agricultural education.
	5.1.2	Compare the educational requirements for entry to multiple agricultural education careers.
	5.1.3	Conduct a self-assessment to determine potential agricultural education career paths.
<b>Topic 5.5</b>	<b>Demonstrate impactful leadership as a credible resource for AFNR.</b>	
	<b>Student Competencies</b>	
	5.5.1	Understand personal leadership traits (such as organizational and personal management skills) that contribute to meeting the needs of learners, school, community, the AFNR industry, etc.
	5.5.2	Apply personal leadership traits to enhance professional education and leadership practice in the workplace (e.g., time management, planning, prioritizing, etc.).
<b>Topic 5.6</b>	<b>Identify the methods and characteristics of effective verbal, nonverbal, written, and visual communication.</b>	
	<b>Student Competencies</b>	
	5.6.5	Evaluate the benefits of using different communication methods in AFNR.
	5.6.6	Create a communication plan for addressing questions, situations, and criticism of issues within AFNR.
<b>Topic 5.7</b>	<b>Analyze the use of verbal, nonverbal, written, and visual communication platforms in AFNR.</b>	
	<b>Student Competencies</b>	
	5.7.5	Design different forms of written and visual communication to achieve a communication strategy.
	5.7.6	Investigate the misuse and potential impact of digital communication tools (e.g., misinformation, plagiarism, generative AI, misuse of photos, copyright, etc.).
<b>Topic 5.8</b>	<b>Analyze similarities and differences between verbal, nonverbal, written, and visual communication methods.</b>	
	<b>Student Competencies</b>	
	5.8.1	Identify distinctions between written communications such as newsletters, news releases, advertisements, opinion pieces, etc.
	5.8.2	Identify distinctions between visual communications including video/digital media, graphic design, and the internet/social media.
	5.8.3	Identify distinctions between verbal communications including public speaking, presentations, debate, radio, etc.
	5.8.4	Examine the use and importance of written communication in AFNR.
	5.8.5	Examine the use and importance of visual communication in AFNR.
	5.8.6	Examine the use and importance of verbal communication in AFNR.
<b>Topic 5.9</b>	<b>Develop a communications plan that includes purpose, target audience, message, medium, and outcome evaluation.</b>	

Student Competencies		
	5.9.1	Identify the purpose of a communications plan (e.g., to influence, educate, inform, change behavior, etc.).
Topic 5.10	Identify, apply and demonstrate communication skills and methods per the communications plan.	
Student Competencies		
	5.10.1	Identify written communication methods (e.g., news release, blog, social media post, email communication, radio script, etc.) to effectively convey a message to AFNR.
	5.10.2	Identify visual communication methods (e.g., Facebook image, graphic, video, GIFS, photographs, interactive content, etc.) to effectively convey a message to ARNR.
	5.10.3	Identify verbal communication methods (e.g. radio script, speech/presentation, podcast, face-to-face conversation, etc.) to effectively convey a message to AFNR.
Topic 5.11	Identify characteristics and behaviors that constitute ethical, efficient, and effective leadership.	
Student Competencies		
	5.11.1	Identify the characteristics of ethical, efficient, and effective leaders (e.g., relates to others, is inclusive, exhibits integrity, etc.) in workplace and community settings.
Topic 5.12	Demonstrate leadership through advocacy for AFNR-related issues.	
Student Competencies		
	5.12.1	Identify personal leadership scenarios that have traits that contributed to meeting the needs of students, school, community, and the AFNR industry.

<b>Standard 6</b>	<b><i>ENVIRONMENTAL SYSTEMS</i></b>	
<b>Topic 6.3</b>	<b>Interpret and evaluate the impact of laws, agencies, policies, practices, and consumer preferences affecting environmental service systems.</b>	
	<b>Student Competencies</b>	
	6.3.4	Research policies, practices and initiatives common in business and advocacy groups associated with environmental sustainability systems (e.g., zero-waste, LEED-certified, locally-grown, etc.).
	6.3.5	Analyze how laws associated with environmental sustainability systems are developed for local (e.g., wellhead protection, littering, etc.), tribal, state (e.g., endangered species, etc.), and federal (e.g., Clean Air Clean Water, etc.) governments.
	6.3.6	Analyze the specific purpose of government agencies associated with environmental sustainability systems.
	6.3.7	Analyze the specific purpose of Non Government Organizations associated with environmental sustainability systems.
	6.3.8	Assess the intent, feasibility, and effectiveness of policies, practices, and initiatives common in business and advocacy groups associated with environmental sustainability systems.
	6.3.9	Evaluate the impact of laws associated with environmental sustainability systems (e.g., wildlife, people, environment, economy, etc.).
<b>Topic 6.4</b>	<b>Compare and contrast the impact of current trends on regulation of environmental sustainability systems.</b>	
	<b>Student Competencies</b>	
	6.4.1	Research the purpose, implementation, and impact of greenhouse gas emission policies (e.g., cap-and-trade, emission offsetting, zero-emissions, carbon-neutrality, carbon sequestration, etc.).
	6.4.2	Identify environmental sustainability systems regulations on international trade (e.g., Clean Air Act, EISA, Clean Water Act, Superfund, etc.).
	6.4.3	Summarize the impact that population growth has on environmental sustainability systems.
	6.4.4	Identify a current regional policy or topic related to environmental sustainability systems.
	6.4.5	Assess the impact of greenhouse gas emissions policies.
	6.4.6	Examine the impact of environmental sustainability systems regulations on international trade.
	6.4.7	Analyze the correlation between increased population size and the need for regulation of environmental sustainability systems.
	6.4.8	Assess the impact of a current policy or topic on the region's environmental sustainability systems.
	6.4.9	Devise a plan for educating others about greenhouse gas emissions and the impact on the supply chain.
<b>Topic 6.5</b>	<b>Examine and summarize the impact of public perceptions and social movements on the regulation of environmental sustainability systems.</b>	
	<b>Student Competencies</b>	
	6.5.1	Summarize how the perception and regulation of environmental sustainability systems has changed over time.
	6.5.2	Examine how social changes (e.g., zero-waste philosophy, carbon footprints, recycling, etc.) have affected the implementation of new environmental sustainability systems.

<b>Topic 6.6    Apply meteorology principles to environmental sustainability systems.</b>		
<b>Student Competencies</b>		
	6.6.5	Examine how components of the atmosphere (e.g., weather systems and patterns, structure of the atmosphere, etc.) affect environmental sustainability systems.
	6.6.6	Compare the relationships between meteorological conditions, air quality, and air pollutants.
	6.6.7	Assess the potential environmental, economic, and social consequences of climate change.
	6.6.8	Analyze how the greenhouse effect may alter the earth's balance of energy.
	6.6.9	Evaluate the impact of atmospheric conditions on environmental sustainability systems using meteorological data.
	6.6.10	Interpret data measuring air pollution, its threat on human populations, and ecological interactions.
	6.6.11	Evaluate the potential impacts of global climate change on environmental sustainability systems.
<b>Topic 6.10    Apply ecology principles to environmental sustainability systems.</b>		
<b>Student Competencies</b>		
	6.10.1	Describe the role that biodiversity plays in environmental sustainability systems and how biodiversity can be measured.
	6.10.2	Explain the role played by habitats on environmental sustainability systems.
	6.10.3	Explain how carrying capacities relate to environmental sustainability systems (e.g., waste processing, rate or production of pollution, disease, etc.).
	6.10.4	Describe how ecological interactions can be used to assess environmental sustainability systems (e.g., macro invertebrates and/or amphibians as bioindicators).

<b>Standard 7</b>	<b><i>FOOD PRODUCTS AND PROCESSING SYSTEMS</i></b>	
<b>Topic 7.9</b>	<b>Create food distribution plans and procedures to ensure safe delivery of food products.</b>	
	<b>Student Competencies</b>	
	7.9.1	Describe the environmental impact of distributing food locally and globally.
	7.9.2	Describe the various paths food products take to get from food processing centers to consumers.
	7.9.3	Summarize different types of market demands for food products (e.g., local food, organic, non-GMO, etc.).
	7.9.4	Compare ways to reduce environmental impact from food distribution activities.
	7.9.5	Examine safety procedures used in food distribution to ensure a safe product is being delivered to consumers.
	7.9.6	Assess how market demand for food products influences the distribution of food products.
<b>Topic 7.10</b>	<b>Examine the scope of the food industry by evaluating local and global policies, trends, and customs for food production.</b>	
	<b>Student Competencies</b>	
	7.10.1	Summarize examples of policy and legislation that affect food products and processing systems in the United States and internationally (e.g., labeling, GMOs, biosecurity, food system policy, dietary guidelines, etc.).
	7.10.2	Describe the impact of consumer trends on food products and processing organic practices (e.g., health and nutrition, organic, information about food products, local food movements, farm-to-fork supply chains, food system transparency, etc.).
	7.10.3	Summarize cultural differences regarding food products and processing practices.
	7.10.4	Analyze the similarities and differences amongst policies and legislation that affect the food products and processing system in the U.S. or internationally.
	7.10.5	Implement methods to obtain data on food consumer trends in a specific market.
	7.10.6	Analyze food production and distribution outcomes based on cultural customs.
	7.10.7	Defend a personal point of view on policies and legislation that affect the food products and processing system in the U.S. or internationally
<b>Topic 7.12</b>	<b>Identify the purpose of industry organizations, groups, and regulatory agencies that influence the local and global food systems.</b>	
	<b>Student Competencies</b>	
	7.12.1	Summarize the purposes of organizations that influence or regulate the food products and processing industry.
	7.12.2	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).
	7.12.3	Analyze the changes in the food products and processing industry brought about by industry organizations or regulatory agencies.

<b>Standard 8</b>	<b><i>NATURAL RESOURCES SYSTEMS</i></b>	
<b>Topic 8.7</b>	<b>Examine and interpret the purpose, enforcement, impact, and effectiveness of laws, agencies, and private and public organizations related to natural resource management, protection, enhancement, and improvement (e.g., water regulations, game laws, environmental policy, local, state, and national conservation organizations, agricultural extension service, etc.).</b>	
	<b>Student Competencies</b>	
	8.7.1	List the types of laws associated with natural resource systems.
	8.7.2	Describe the types of agencies and organizations associated with natural resources systems.
	8.7.3	Analyze laws associated with natural resources systems.
	8.7.4	Analyze the relationships between public and private agencies and organizations associated with natural resources systems.
<b>Topic 8.8</b>	<b>Assess the impact of human activities on the availability of natural resources.</b>	
	<b>Student Competencies</b>	
	8.8.1	Summarize the relationship between natural resources, ecosystems, and human activity.
	8.8.2	Categorize the primary causes of extinction of living species due to human activity (e.g., overharvesting, habitat loss, invasive species, pollution, etc.).
	8.8.3	Describe the manner in which consumer decisions are related to the depletion of natural resources.
<b>Topic 8.9</b>	<b>Analyze how social perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.</b>	
	<b>Student Competencies</b>	
	8.9.1	Summarize the different social perceptions of natural resources (e.g., public versus private land ownership, laws and regulations, economics, green technology, traditional ecological knowledge, etc.).
	8.9.2	Illustrate how historical figures and social movements played a prominent role in shaping how natural resources are viewed and used today (e.g., Tribal and traditional ecological knowledge, Aldo Leopold, Teddy Roosevelt, John Muir, Rachel Carson, Gaylord Nelson, etc.).
	8.9.3	Describe how technology has affected the use and views of natural resources.
	8.9.4	Analyze how social perceptions can affect the use and sustainability of natural resources.
	8.9.5	Examine the relationship between current trends in natural resource systems and historical figures and movements that played a prominent role in shaping how natural resources are viewed and used today.
	8.9.6	Analyze how some technological advancements changed how natural resources were used and viewed (e.g., Industrial Revolution, fossil fuels, green technology, etc.).
<b>Topic 8.10</b>	<b>Examine and explain how economics affects the use of natural resources.</b>	
	<b>Student Competencies</b>	
	8.10.1	Compare and contrast how the economic value of a natural resource affects its availability.
	8.10.2	Describe the impact of the use of natural resources on local, tribal, state, and national economies (e.g., outdoor recreation, energy production, preservation, etc.).



	8.10.3	Compare and contrast the economic impact of green technology and alternative energy.
	8.10.4	Assess whether economic value increases or decreases the conservation, protection, improvement, and enhancement of natural resources.
	8.10.5	Assess the importance of the use of natural resources on local, tribal, state, and national economies.
	8.10.6	Analyze how the adoption of green technology and/or alternative energy affected a local, tribal, state, or national economy.
<b>Topic 8.11</b>	<b>Communicate information to the public regarding topics related to the management, protection, enhancement, and improvement of natural resources.</b>	
	<b>Student Competencies</b>	
	8.11.1	Describe ways in which a message regarding natural resources may be communicated to the public through standard media sources (e.g., press, radio/podcasts, TV, public appearances, social media etc.).
	8.11.2	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.).
	8.11.3	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.