Agribusiness Systems

Code	Performance Indicator
ABS.01.01	Apply micro- and macroeconomic principles to plan and manage inputs and outputs in an AFNR business.
ABS.01.02	Read, interpret, evaluate and write statements of purpose to guide business goals, objectives and resource allocation.
ABS.01.03	Devise and apply management skills to organize and run an AFNR business in an efficient, legal and ethical manner.
ABS.01.04	Evaluate, develop and implement procedures used to recruit, train and retain productive human resources for AFNR businesses.
ABS.02.01	Apply fundamental accounting principles, systems, tools and applicable laws and regulations to record, track and audit AFNR business transactions (e.g., accounts, debits, credits, assets, liabilities,
ABS.02.02	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
ABS.03.01	Develop, assess and manage cash budgets to achieve AFNR business goals.
ABS.03.02	Analyze credit needs and manage credit budgets to achieve AFNR business goals.
ABS.04.01	Analyze characteristics and planning requirements associated with developing business plans for different types of AFNR businesses.
ABS.04.02	Develop production and operational plans for an AFNR business.
ABS.04.03	Identify and apply strategies to manage or mitigate risk.
ABS.05.01	Analyze the role of markets, trade, competition and price in relation to an AFNR business sales and marketing plans.
ABS.05.02	Assess and apply sales principles and skills to accomplish AFNR business objectives.
ABS.05.03	Assess marketing principles and develop marketing plans to accomplish AFNR business objectives.

Animal Systems

Code	Performance Indicator
AS.01.01	Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment.
AS.01.02	Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.
AS.01.03	Analyze and apply laws and sustainable practices to animal agriculture from a global perspective.
AS.02.01	Demonstrate management techniques that ensure animal welfare.
AS.02.02	Analyze procedures to ensure that animal products are safe for consumption (e.g., use in food system, etc.).
AS.03.01	Analyze the nutritional needs of animals.
AS.03.02	Analyze feed rations and assess if they meet the nutritional needs of animals.
AS.03.03	Utilize industry tools to make animal nutrition decisions.
AS.04.01	Evaluate animals for breeding readiness and soundness.
AS.04.02	Apply scientific principles to select and care for breeding animals.
AS.04.03	Apply scientific principles to breed animals.
AS.05.01	Design animal housing, equipment and handling facilities for the major systems of animal production.
AS.05.02	Comply with government regulations and safety standards for facilities used in animal production.
AS.06.01	Classify animals according to taxonomic classification systems and use (e.g. agricultural, companion, etc.).
AS.06.02	Apply principles of comparative anatomy and physiology to uses within various animal systems.
AS.06.03	Select and train animals for specific purposes and maximum performance based on anatomy and physiology.
AS.07.01	Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.
AS.07.02	Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national, and global level.
AS.08.01	Design and implement methods to reduce the effects of animal production on the environment.
AS.08.02	Evaluate the effects of environmental conditions on animals and create plans to ensure favorable environments for animals.

Biotechnology Systems

Code	Performance Indicator
BS.01.01	Investigate and explain the relationship between past, current and emerging applications of biotechnology in agriculture (e.g., major innovators, historical developments, potential applications
BS.01.02	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.).
BS.01.03	Analyze the relationship and implications of bioethics, laws and public perceptions on applications of biotechnology in agriculture (e.g., ethical, legal, social, cultural issues).
BS.02.01	Read, document, evaluate and secure accurate laboratory records of experimental protocols, observations and results.
BS.02.02	Implement standard operating procedures for the proper maintenance, use and sterilization of equipment in a laboratory.
BS.02.03	Apply standard operating procedures for the safe handling of biological and chemical materials in a laboratory.
BS.02.04	Safely manage and dispose of biological materials, chemicals and wastes according to standard operating procedures.
BS.02.05	Examine and perform scientific procedures using microbes, DNA, RNA and proteins in a laboratory.
BS.03.01	Apply biotechnology principles, techniques and processes to create transgenic species through genetic engineering.
BS.03.02	Apply biotechnology principles, techniques and processes to enhance the production of food through the use of microorganisms and enzymes.
BS.03.03	Apply biotechnology principles, techniques and processes to protect the environment and maximize use of natural resources (e.g., biomass, bioprospecting, industrial biotechnology, etc.).
BS.03.04	Apply biotechnology principles, techniques and processes to enhance plant and animal care and production (e.g., selective breeding, pharmaceuticals, biodiversity, etc.).
BS.03.05	Apply biotechnology principles, techniques and processes to produce biofuels (e.g., fermentation, transesterification, methanogenesis, etc.).
BS.03.06	Apply biotechnology principles, techniques and processes to improve waste management (e.g., genetically modified organisms, bioremediation, etc.).

Career Ready Practices

Code	Performance Indicator
CRP.01.01	Model personal responsibility in the workplace and community.
CRP.01.02	Evaluate and consider the near-term and long-term impacts of personal and professional decisions on employers and community before taking action.
CRP.01.03	Identify and act upon opportunities for professional and civic service at work and in the community.
CRP.02.01	Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community.
CRP.02.02	Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.
CRP.03.01	Design and implement a personal wellness plan.
CRP.03.02	Design and implement a personal financial management plan.
CRP.04.01	Speak using strategies that ensure clarity, logic, purpose and professionalism in formal and informal settings.
CRP.04.02	Produce clear, reasoned and coherent written and visual communication in formal and informal settings.
CRP.04.03	Model active listening strategies when interacting with others in formal and informal settings.
CRP.05.01	Assess, identify and synthesize the information and resources needed to make decisions that positively impact the workplace and community.
CRP.05.02	Make, defend and evaluate decisions at work and in the community using information about the potential environmental, social and economic impacts.
CRP.06.01	Synthesize information, knowledge and experience to generate original ideas and challenge assumptions in the workplace and community.
CRP.06.02	Assess a variety of workplace and community situations to identify ways to add value and improve the efficiency of processes and procedures.
CRP.06.03	Create and execute a plan of action to act upon new ideas and introduce innovations to workplace and community organizations.
CRP.07.01	Select and implement reliable research processes and methods to generate data for decision-making in the workplace and community.
CRP.07.02	Evaluate the validity of sources and data used when considering the adoption of new technologies, practices and ideas in the workplace and community.
CRP.08.01	Apply reason and logic to evaluate workplace and community situations from multiple perspectives.
CRP.08.02	Investigate, prioritize and select solutions to solve problems in the workplace and community.
CRP.08.03	Establish plans to solve workplace and community problems and execute them with resiliency.
CRP.09.01	Model characteristics of ethical and effective leaders in the workplace and community (e.g. integrity, self-awareness, self-regulation, etc.).

Career Ready Practices (continued)

Code	Performance Indicator
CRP.09.02	Implement personal management skills to function effectively and efficiently in the workplace (e.g., time management, planning, prioritizing, etc.).
CRP.09.03	Demonstrate behaviors that contribute to a positive morale and culture in the workplace and community (e.g., positively influencing others, effectively communicating, etc.).
CRP.10.01	Identify career opportunities within a career cluster that match personal interests, talents, goals and preferences.
CRP.10.02	Examine career advancement requirements (e.g., education, certification, training, etc.) and create goals for continuous growth in a chosen career.
CRP.10.03	Develop relationships with and assimilate input and/or advice from experts (e.g., counselors, mentors, etc.) to plan career and personal goals in a chosen career area.
CRP.10.04	Identify, prepare, update and improve the tools and skills necessary to pursue a chosen career path.
CRP.11.01	Research, select and use new technologies, tools and applications to maximize productivity in the workplace and community.
CRP.11.02	Evaluate personal and organizational risks of technology use and take actions to prevent or minimize risks in the workplace and community.
CRP.12.01	Contribute to team-oriented projects and builds consensus to accomplish results using cultural global competence in the workplace and community.
CRP.12.02	Create and implement strategies to engage team members to work toward team and organizational goals in a variety of workplace and community situations (e.g., meetings,

Cluster Skill

Code	Performance Indicator
CS.01.01	Research, examine and discuss issues and trends that impact AFNR systems on local, state, national and global levels.
CS.01.02	Examine technologies and analyze their impact on AFNR systems.
CS.01.03	Identify public policies and examine their impact on AFNR systems.
CS.02.01	Research and use geographic and economic data to solve problems in AFNR systems.
CS.02.02	Examine the components of the AFNR systems and assess their impact on the local, state, national and global society and economy.
CS.03.01	Identify and explain the implications of required regulations to maintain and improve safety, health and environmental management systems.
CS.03.02	Develop and implement a plan to maintain and improve health, safety and environmental compliance and performance.
CS.03.03	Apply health and safety practices to AFNR workplaces.
CS.03.04	Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.
CS.04.01	Identify and implement practices to steward natural resources in different AFNR systems.
CS.04.02	Assess and explain the natural resource related trends, technologies and policies that impact AFNR systems.
CS.05.01	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,
CS.05.02	Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.
CS.06.01	Examine and explain foundational cycles and systems of AFNR.
CS.06.02	Analyze and explain the connection and relationships between different AFNR systems on a national and global level.

Environmental Service Systems

Code	Performance Indicator
ESS.01.01	Analyze and interpret laboratory and field samples in environmental service systems.
ESS.01.02	Properly utilize scientific instruments in environmental monitoring situations (e.g., laboratory equipment, environmental monitoring instruments, etc.).
ESS.02.01	Interpret and evaluate the impact of laws, agencies, policies and practices affecting environmental service systems.
ESS.02.02	Compare and contrast the impact of current trends on regulation of environmental service systems (e.g., climate change, population growth, international trade, etc.).
ESS.02.03	Examine and summarize the impact of public perceptions and social movements on the regulation of environmental service systems.
ESS.03.01	Apply meteorology principles to environmental service systems.
ESS.03.02	Apply soil science and hydrology principles to environmental service systems.
ESS.03.03	Apply chemistry principles to environmental service systems.
ESS.03.04	Apply microbiology principles to environmental service systems.
ESS.03.05	Apply ecology principles to environmental service systems.
ESS.04.01	Use pollution control measures to maintain a safe facility and environment.
ESS.04.02	Manage safe disposal of all categories of solid waste in environmental service systems.
ESS.04.03	Apply techniques to ensure a safe supply of drinking water and adequate treatment of wastewater according to applicable rules and regulations.
ESS.04.04	Compare and contrast the impact of conventional and alternative energy sources on the environment and operation of environmental service systems.
ESS.05.01	Use technological and mathematical tools to map land, facilities and infrastructure for environmental service systems.
ESS.05.02	Perform assessments of environmental conditions using equipment, machinery and technology.

Food Products and Processing

Code	Performance Indicator
FPP.01.01	Analyze and manage operational and safety procedures in food products and processing facilities.
FPP.01.02	Apply food safety and sanitation procedures in the handling and processing of food products to ensure food quality.
FPP.01.03	Apply food safety procedures when storing food products to ensure food quality.
FPP.02.01	Apply principles of nutrition and biology to develop food products that provide a safe, wholesome and nutritious food supply for local and global food systems.
FPP.02.02	Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.
FPP.02.03	Apply principles of human behavior to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.
FPP.03.01	Implement selection, evaluation and inspection techniques to ensure safe and quality food products.
FPP.03.02	Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.
FPP.03.03	Create food distribution plans and procedures to ensure safe delivery of food products.
FPP.04.01	Examine the scope of the food industry by evaluating local and global policies, trends and customs for food production.
FPP.04.02	Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.
FPP.04.03	Identify and explain the purpose of industry organizations, groups and regulatory agencies that influence the local and global food systems.

Natural Resource Systems

Code	Performance Indicator
NRS.01.01	Apply methods of classification to examine natural resource availability and ecosystem function in a particular region.
NRS.01.02	Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region.
NRS.01.03	Apply ecological concepts and principles to atmospheric natural resource systems.
NRS.01.04	Apply ecological concepts and principles to aquatic natural resource systems.
NRS.01.05	Apply ecological concepts and principles to terrestrial natural resource systems.
NRS.01.06	Apply ecological concepts and principles to living organisms in natural resource systems.
NRS.02.01	Examine and interpret the purpose, enforcement, impact and effectiveness of laws and agencies related to natural resource management, protection, enhancement and improvement (e.g., water
NRS.02.02	Assess the impact of human activities on the availability of natural resources.
NRS.02.03	Analyze how modern perceptions of natural resource management, protection, enhancement and improvement change and develop over time.
NRS.02.04	Examine and explain how economics affects the use of natural resources.
NRS.02.05	Communicate information to the public regarding topics related to the management, protection, enhancement, and improvement of natural resources.
NRS.03.01	Sustainably produce, harvest, process and use natural resource products (e.g., forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc.).
NRS.03.02	Demonstrate cartographic skills, tools and technologies to aid in developing, implementing and evaluating natural resource management plans.
NRS.04.01	Demonstrate natural resource protection, maintenance, enhancement and improvement techniques.
NRS.04.02	Diagnose plant and wildlife diseases and follow protocols to prevent their spread.
NRS.04.03	Prevent or manage introduction of ecologically harmful species in a particular region.
NRS.04.04	Manage fires in natural resource systems.

Plant Systems

Code	Performance Indicator
PS.01.01	Determine the influence of environmental factors on plant growth.
PS.01.02	Prepare and manage growing media for use in plant systems.
PS.01.03	Develop and implement a fertilization plan for specific plants or crops.
PS.02.01	Classify plants according to taxonomic systems.
PS.02.02	Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.
PS.02.03	Apply knowledge of plant physiology and energy conversion to plant systems.
PS.03.01	Demonstrate plant propagation techniques in plant system activities.
PS.03.02	Develop and implement a management plan for plant production.
PS.03.03	Develop and implement a plan for integrated pest management for plant production.
PS.03.04	Apply principles and practices of sustainable agriculture to plant production.
PS.03.05	Harvest, handle and store crops according to current industry standards.
PS.04.01	Evaluating, identifying and preparing plants to enhance an environment.
PS.04.02	Create designs using plants.

Power, Structural & Technical Systems

Code	Performance Indicator
PST.01.01	Apply physical science and engineering principles to assess and select energy sources for AFNR power, structural and technical systems.
PST.01.02	Apply physical science and engineering principles to design, implement and improve safe and efficient mechanical systems in AFNR situations.
PST.01.03	Apply physical science principles to metal fabrication using a variety of welding and cutting processes (e.g., SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch, etc.).
PST.02.01	Perform preventative maintenance and scheduled service to maintain equipment, machinery and power units used in AFNR settings.
PST.02.02	Operate machinery and equipment while observing all safety precautions in AFNR settings.
PST.03.01	Troubleshoot, service and repair components of internal combustion engines using manufacturers' guidelines.
PST.03.02	Service electrical systems and components of mechanical equipment and power systems using a variety of troubleshooting and/or diagnostic methods.
PST.03.03	Utilize manufacturers' guidelines to diagnose and troubleshoot malfunctions in machinery, equipment and power source systems (e.g., hydraulic, pneumatic, transmission, steering,
PST.04.01	Create sketches and plans for AFNR structures.
PST.04.02	Determine structural requirements, specifications and estimate costs for AFNR structures
PST.04.03	Follow architectural and mechanical plans to construct, maintain and/or repair AFNR structures (e.g., material selection, site preparation and/or layout, plumbing, concrete/masonry, etc.).
PST.04.04	Apply electrical wiring principles in AFNR structures.
PST.05.01	Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems.
PST.05.02	Prepare and/or use electrical drawings to design, install and troubleshoot electronic control systems in AFNR settings.
PST.05.03	Apply geospatial technologies to solve problems and increase the efficiency of AFNR systems.