

Cluster Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: **Agriculture**

Industry-based knowledge and skill

Skill Type

AG 01.01 Acquire the specific academic knowledge and skills necessary to pursue a full range of career and post-secondary opportunities within agricultural business and industries.

Technical Academic Skill

Performance Indicators

Delivery Level

AG 01.01.01	Pass academic assessment tests.
AG 01.01.01.01	Achieve an acceptable score on Oregon statewide academic assessments.
AG 01.01.01.02	Score successfully on an assessment test (e.g., SAT, Compass, to achieve entrance into an agricultural college program).
AG 01.01.02	Use reading and investigation strategies to obtain and analyze agricultural information from a variety of resources (e.g., books, journals, magazines and the Internet).
AG 01.01.02.01	Obtain required information through research to expand knowledge and skills for conversations, presentations and work assignments.
AG 01.01.02.02	Identify and access key resources appropriate for general reference materials (e.g., books, journals and magazines).
AG 01.01.02.03	Identify and access key resources appropriate for obtaining scholarly and academic information.
AG 01.01.02.04	Analyze materials to determine their value for research and development.
AG 01.01.02.05	Organize information by topics.
AG 01.01.02.06	Use word analysis strategies and dictionaries to understand new words.
AG 01.01.02.07	Identify scope sequence and content of material.
AG 01.01.02.08	Break complex sentences apart to enhance understanding.
AG 01.01.02.09	Read difficult passages orally to further clarify understanding.
AG 01.01.03	Demonstrate knowledge and skill proficiency related to academic skills.
AG 01.01.03.03	Identify the academic skill levels necessary to work in a specific field.
AG 01.01.03.04	Identify the academic degrees or certifications required to enter a desired job/career.

Industry-based knowledge and skill

Skill Type

AG 02.01 Use oral and written communication skills in creating, expressing and interpreting agricultural information and ideas including technical terminology.

Technical Academic Skill

Performance Indicators

Delivery Level

AG 02.01.01	Develop good reading skills and practices to enhance oral and written communications.
AG 02.01.01.01	Read a variety of materials that include technical concepts, knowledge and vocabulary to develop a broad knowledge base to enhance communication.
AG 02.01.01.02	Increase reading skills through reading challenging material.
AG 02.01.01.03	Identify words, technical language and content for further study and analysis.
AG 02.01.02	Compose written materials to communicate technical information, either orally or in writing, to a variety of audiences.
AG 02.01.02.01	Incorporate multi-paragraph writing, technical concepts, knowledge and vocabulary to convey technical information.
AG 02.01.02.02	Develop and incorporate tables, charts, graphs and figures to support written and oral communications.
AG 02.01.02.03	Use information technology to design, produce and present written and multimedia materials.
AG 02.01.03	Apply active listening skills to acquire information in both formal and informal circumstances.
AG 02.01.03.01	Identify and accommodate the personal communication styles of the participants to achieve full meaning in processing and sharing information.

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Performance Indicators

Delivery Level

AG 02.01.03.02	Interpret the receiver's verbal and non-verbal behaviors to augment communication.
AG 02.01.03.03	Use restatement, paraphrasing and reflection techniques to verify perception and understanding.
AG 02.01.03.04	Demonstrate non-verbal attending (e.g., eye contact, body language, use of silence).
AG 02.01.03.05	Develop a portfolio to provide evidence of academic skills or proficiencies that are necessary for a specific agricultural job or career.
AG 02.01.03.06	Demonstrate skills in recognizing the variety of foci communication can take (e.g., speaker focus, topic focus, listener focus).
AG 02.01.03.07	Record and summarize information in written notes.
AG 02.01.04	Use speaking skills to present information orally in formal and informal situations.
AG 02.01.04.01	Access a broad range of technical concepts, knowledge and vocabulary to develop and conduct both formal and informal presentations and discussions.
AG 02.01.04.02	Identify and apply human relations skills to contribute effectively to group discussions and meetings (e.g., inclusiveness, safe environment for discussion, sensitivity to ethnic and social concerns).
AG 02.01.04.03	Identify characteristics of the audience and adjust the presentation to their knowledge and skill level.
AG 02.01.04.04	Use technical terms and concepts correctly and in language that all audience participants can understand.
AG 02.01.04.05	Use logical organization and structure to achieve coherence of major points.
AG 02.01.05	Write clearly to communicate written ideas, results and questions for a variety of audiences.
AG 02.01.05.01	Produce written communications for journals, newsletters or other informative articles using language appropriate for the audience.
AG 02.01.05.02	Produce a document that describes and discusses aspects and components of the industry for people who are either not informed or not involved.
AG 02.01.06	Use speaking skills to conduct a dialogue regarding issues/opportunities in agriculture, in both formal and informal situations.
AG 02.01.06.01	Monitor listener behaviors when speaking in order to improve communication.
AG 02.01.06.02	Prepare presentations to explain issues of an agricultural industry to both large groups and individuals.
AG 02.01.06.03	Discuss aspects of the industry with an audience of both industry professionals and people who are not involved in the industry.

Industry-based knowledge and skill

Skill Type

AG 02.02 Communicate agricultural technical information clearly and efficiently using templates, standard formats and technical instruments and tools. **Technical Career Skill**

Performance Indicators

Delivery Level

AG 02.02.01	Use technical communication language and tools to document work and progress.
AG 02.02.01.01	Record technical information (e.g., soilpH or water quality using a technical tool).
AG 02.02.01.02	Compose a technical report (e.g., food caloric value analysis using industry standard formats or templates).
AG 02.02.01.03	Communicate/ transfer documentation to others.

Industry-based knowledge and skill

Skill Type

AG 03.01 **Technical Career Skill**

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Solve agriculture problems using critical thinking skills (e.g., analyze, synthesize and evaluate, independently and in teams).

Performance Indicators

Delivery Level

AG 03.01.01	Use structured problem-solving methods to improve the performance of organizational or technological systems.
AG 03.01.01.01	Identify a written tool or a concept map to illustrate the dynamics of the problem.
AG 03.01.01.02	Identify and apply the elements of management of oral forums to facilitate problem-solving.
AG 03.01.02	Use critical and judicious analysis of information to solve problems.
AG 03.01.02.01	Identify a process to analyze, synthesize and evaluate information and apply the implications to a variety of issues.
AG 03.01.02.02	Break large problems into smaller ones.
AG 03.01.02.03	Identify key issues involved in the problem and define the problem in concrete terms.
AG 03.01.02.04	Conduct research to broaden the understanding of a problem.
AG 03.01.02.05	Develop a matrix of pros, cons, risk liabilities and potential outcomes.
AG 03.01.02.06	Identify all affected parties.
AG 03.01.02.07	Brainstorm possible alternatives.
AG 03.01.02.08	Explore the consequences and potential impact of each alternative.
AG 03.01.03	Synthesize elements in a problem to develop a solution(s); include creative options.
AG 03.01.03.01	Verify information for completeness and accuracy.
AG 03.01.03.02	Identify key elements and show relationships through mapping.
AG 03.01.03.03	Prioritize recommendations and support with discussion.
AG 03.01.03.04	Identify and apply methods to obtain creative solutions (e.g., brainstorming, mind mapping).
AG 03.01.04	Evaluate problem solutions to determine their potential efficiency and effectiveness.
AG 03.01.04.01	Evaluate the problem solving process for efficiency and effectiveness.
AG 03.01.04.02	Evaluate the feasibility of each potential solution.
AG 03.01.04.03	Compare and contrast the actual outcomes with the anticipated outcome.
AG 03.01.04.04	Formulate a corrective action plan as necessary.

Industry-based knowledge and skill

Skill Type

AG 03.02 Access relevant resources to identify public policies, issues and regulations impacting agricultural management.

Technical Career Skill

Performance Indicators

Delivery Level

AG 03.02.01	Review and identify federal, state and local laws regulating agriculture.
AG 03.02.01.01	Identify key information resources for changes to existing regulations, major laws and new laws.
AG 03.02.01.02	Describe the major regulations that impact the management of an individual resource (e.g., a farm or crop).
AG 03.02.01.03	Identify business or farming practices that support or violate regulations.
AG 03.02.01.04	Based on current information sources, list significant issues that impact an agricultural business or industry.
AG 03.02.02	Research current issues related to agricultural management; identify resources (e.g., professional journals, research).
AG 03.02.02.01	Determine if resources and information are biased toward a particular objective or outcomes.
AG 03.02.02.02	Develop a list of priority issues that affect agricultural management.
AG 03.02.03	Gather public input for agricultural management decision-making.
AG 03.02.03.01	Conduct a local survey of public perceptions and desires concerning an agricultural issue(s).
AG 03.02.03.02	Analyze the results of a survey.

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Delivery Level

AG 03.02.03.03	Organize the results of the survey for a report.
AG 03.02.04	Synthesize information to evaluate public policy issues related to agriculture.
AG 03.02.04.01	Identify alternatives to an issue's potential solution.
AG 03.02.04.02	Evaluate alternatives for strengths and weakness and risk.
AG 03.02.04.03	Recommend a solution based on research and analysis.

Industry-based knowledge and skill

Skill Type

AG 04.01 Use information technology tools to access, manage, integrate, create, and communicate agricultural information. **Technical Career Skill**

Performance Indicators

Delivery Level

AG 04.01.01	Use personal management system (calendar software, PDA, online calendar, outlook calendar).
AG 04.01.01.01	Manage personal schedule and contact information.
AG 04.01.01.02	Create memos and notes.
AG 04.01.01.03	Understand and identify the functions and purpose of e-mail systems and applications.
AG 04.01.02	Use electronic mail applications.
AG 04.01.02.01	Identify and demonstrate the functions and purpose of e-mail systems for professional use.
AG 04.01.02.02	Demonstrate use of e-mail to communicate within and across organizations.
AG 04.01.02.03	Identify the professional and ethical responsibilities associated with using electronic mail.
AG 04.01.03	Use Internet applications.
AG 04.01.03.01	Search for and access information.
AG 04.01.03.02	Develop an electronic filing system to manage information.
AG 04.01.04	Use writing/publishing applications.
AG 04.01.04.01	Prepare simple reports or a business communication.
AG 04.01.04.02	Prepare complex reports and other business communications, integrating graphics and other non-text related elements.
AG 04.01.04.03	Develop a filing system to manage a variety of resources.
AG 04.01.04.04	Demonstrate how writing/publishing applications can enhance a professional presentation, including spell check, grammar and appropriate language.
AG 04.01.05	Use presentation applications.
AG 04.01.05.01	Prepare and deliver presentations (e.g., training, marketing plans and information updates).
AG 04.01.05.02	Demonstrate proficiency using the key features of a presentation application (e.g., PowerPoint to illustrate workforce employment projections in agricultural careers).
AG 04.01.06	Use spreadsheet applications.
AG 04.01.06.01	Demonstrate use of a spreadsheet application to document real or hypothetical business activity.
AG 04.01.06.02	Set up a spreadsheet application (e.g., Excel).
AG 04.01.07	Use database applications.
AG 04.01.07.01	Manage, analyze and report on interrelated data elements to demonstrate product productivity, analyze costs, or project future sales.
AG 04.01.07.02	Use application features to develop related charts and graphs (e.g., Excel, Access, File Pro) to present agricultural product information to a potential buyer.
AG 04.01.08	Use collaborative/groupware applications.
AG 04.01.08.01	Demonstrate the use of shared schedule and contact information to facilitate group work.

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Delivery Level

AG 04.01.08.02	Demonstrate management of shared files and online applications to facilitate project team work.
AG 04.01.08.03	Use interactive computer applications to work collaboratively from a distance.
AG 04.01.09	Use Geographic Information System/Global Positions System (GIS/GPS) applications.
AG 04.01.09.01	Create a map for a particular agricultural industry purpose (e.g., planning crop(s) field layout).
AG 04.01.09.02	Locate people, places or things (e.g., fields, food processing plants).
AG 04.01.09.03	Identify the best route for travel for efficient transport of supplies, equipment or products such as farm crops or livestock.
AG 04.01.10	Use computer operations applications.
AG 04.01.10.01	Manage personal computer operation (e.g., set up, start up).
AG 04.01.10.02	Establish and maintain a file storage system including disk clean up.
AG 04.01.10.03	Compress or alter files.
AG 04.01.10.04	Use anti-virus applications.
AG 04.01.11	Use computer- based equipment (containing embedded computers/processors used to control electromechanical devices).
AG 04.01.11.01	Operate computer driven equipment and machines (e.g., lathes, pumps, irrigations systems).
AG 04.01.11.02	Use information from installation and operation manuals to set up and maintain equipment.
AG 04.01.11.03	Troubleshoot computer-driven equipment and machines and access support information.

Industry-based knowledge and skill

Skill Type

AG 05.01 Identify agriculture related organizations, in the agriculture management system and their roles.

Technical Career Skill

Performance Indicators

Delivery Level

AG 05.01.01	Analyze organization performance and goals to understand the level of complexity of agricultural organizations and the agricultural system.
AG 05.01.01.01	Define the role and major functions of agricultural organizations to effectively utilize industry guidelines.
AG 05.01.01.02	Explain the major guidelines used by agricultural organizations to manage and improve performance.
AG 05.01.01.03	Identify the primary economic, social and technological changes and describe their impact on agricultural organizations and the industry during a specific period of time (e.g., the last twenty years).
AG 05.01.01.04	Identify primary technological changes and describe their impact in the industry (e.g., information technology and transportation).
AG 05.01.02	Manage and improve organizational systems to better serve customers.
AG 05.01.02.01	Develop a customer needs to identify methods to efficiently and professionally serve the needs of both internal and external customers.
AG 05.01.02.02	Develop and manage plans and budgets to accomplish organizational goals and objectives.
AG 05.01.02.03	Develop a plan to improve organizational performance including customer satisfaction and service/operations performance.
AG 05.01.02.04	Develop a plan(s) to maintain compliance with organizational policies and government laws and regulations.
AG 05.01.03	Identify the components of an agricultural system to assess the system maintenance requirements.
AG 05.01.03.01	Develop a management plan to improve an agricultural or natural resource system in Oregon.
AG 05.01.03.02	Determine the goals and objectives for each system to manage organizational activities.

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Performance Indicators

Delivery Level

AG 05.01.03.03	Demonstrate the use of technical and system tools to access, manage, integrate, create and evaluate information.
AG 05.01.04	Examine relationships and roles of business, government and society within the agriculture system.
AG 05.01.04.01	To be defined
AG 05.01.04.02	To be defined
AG 05.01.04.03	To be defined

Industry-based knowledge and skill

Skill Type

AG 05.02 Identify how agriculture provide the foundation for life through the application of the Law of the Harvest (reap what you sow). **Technical Career Skill**

Performance Indicators

Delivery Level

AG 05.02.01	Identify the Oregon Department of Education Essential Skills that are applicable to the concepts of the Law of the Harvest
AG 05.02.01.01	To be defined
AG 05.02.01.02	To be defined
AG 05.02.02	Apply the concepts of the Law of the Harvest to your Personal Educational Plan and Profile
AG 05.02.02.01	To be defined
AG 05.02.02.02	To be defined

Industry-based knowledge and skill

Skill Type

AG 06.01 Understand the importance of agricultural related health, safety and environmental management systems and their significance to organizational performance and regulatory compliance. **Technical Career Skill**

Performance Indicators

Delivery Level

AGS06.01.01.00	Explain how the regulations for health, safety and environmental care and protection are inter-related in an agricultural workplace.
AGS06.01.01.01	Identify major regulatory areas (e.g., personal protective equipment and government laws and regulations) related to a specific industry or workplace environment.
AGS06.01.01.02	Identify the health, safety and environmental management systems in agriculture and their impact on system components.
AGS06.01.01.03	Identify how government agencies promote compliance and improved health, safety and environmental performance using a measure or estimated benefits.
AGS06.01.01.04	Examine required government regulations that promote improved safety, health and environmental management systems and the resulting benefits to the industry or workplace.
AGS06.01.01.05	Examine logistics, distribution and transportation organizations and demonstrate understanding of their relevance and contributions to health, safety and the environment.
AGS06.01.02.00	Demonstrate the importance of safety, health and environmental compliance and performance in an agricultural workplace for all employees.
AGS06.01.02.01	Define safety, health and environmental principles, guidelines and training, which promote personal commitment, ensure high level of performance, and a safe workplace.
AGS06.01.02.02	Develop a pollutions/waste prevention plan to contribute to the total productivity improvement and overall safety of the workplace.
AGS06.01.02.03	Summarize accident reports for a specific workplace and make recommendations for more effective procedures.
AGS06.01.02.04	Forecast the results of the implementation of improved safety procedures (e.g., reduction in employee and business insurance costs, reduction in time loss costs).

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Performance Indicators

Delivery Level

AGS06.01.03.00	Examine health risks associated with a particular skill or work assignment to develop workplace safety guidelines.
AGS06.01.03.01	Set personal safety priorities for a specific workplace.
AGS06.01.03.02	Identify and assess mental and physical stresses in the workplace.
AGS06.01.03.03	Identify how stress affects performance in the workplace.
AGS06.01.03.04	Identify risk levels for contamination and injury in a workplace (e.g., improper storage of pesticides, fertilizers, sealing agents).
AGS06.01.03.05	Identify risk levels/factors for injury in a workplace (e.g., unstable stairs; poor lighting, farm machinery without proper working brakes).
AGS06.01.03.06	Identify how stress affects health in the workplace.

Industry-based knowledge and skill

Skill Type

AG 06.02 Identify health goals, emergency procedures for safety and first-aid for agricultural workplaces and occupations.

Technical Career Skill

Performance Indicators

Delivery Level

AG 06.02.01	Create safety/health precaution plans for participation in agricultural workplace projects.
AG 06.02.01.01	Develop goals and a plan to support safety, health and environmental policies and procedures.
AG 06.02.01.02	Develop a plan to improve health, safety and environmental management for a specific workplace.
AG 06.02.01.03	Create a personal professional development plan relating to health, safety and environmental procedures for a specific workplace.
AG 06.02.01.04	Arrange for and use personal protective clothing.
AG 06.02.01.05	Demonstrate specific actions to avoid hazardous work situations.
AG 06.02.02	Demonstrate current first-aid knowledge and procedures and show how they are used within agricultural work sites.
AG 06.02.02.01	Complete a recognized industry level first aid training program.
AG 06.02.02.02	Identify first aid responsibilities of trained employees in the event of workplace accidents.
AG 06.02.02.03	Acquire and maintain cardiopulmonary resuscitation (CPR) certification.
AG 06.02.02.04	Demonstrate knowledge of proper response procedures for medical emergencies in a agricultural workplace.
AG 06.02.03	Identify health and safety policies and procedures for agriculture.
AG 06.02.03.01	Attend safety training, and identify the policies and procedures for various agricultural occupations.
AG 06.02.03.02	Describe the health and safety policies and procedures relevant to specific worksites and assignments.
AG 06.02.03.03	Develop a emergency health and safety action plan in anticipation of an of an event within the agriculture worksite.
AG 06.02.04	Identify and implement appropriate management procedures for potential environmental hazards in the workplace.
AG 06.02.04.01	Identify general workplace safety hazards.
AG 06.02.04.02	Identify general workplace safety precautions/procedures.
AG 06.02.04.03	Explain the purpose of pollution control systems.
AG 06.02.04.04	Describe procedures to comply with environmental regulations.
AG 06.02.04.05	Demonstrate the handling of chemicals and safety equipment appropriately.
AG 06.02.04.06	Maintain environmental health and safety facilities.
AG 06.02.04.07	Handle chemicals and related safety equipment according to recommended protocols.
AG 06.02.05	Demonstrate knowledge and skills that prevent health and safety problems in the workplace.
AG 06.02.05.01	Demonstrate ergonomic procedures for a specific job/workplace.

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Performance Indicators

Delivery Level

- AG 06.02.05.02 Develop an assessment tool to evaluate job/workplace safety.
- AG 06.02.05.03 Evaluate a safety-training plan; list its strengths, weakness, opportunities, and targets.
- AG 06.02.05.04 Demonstrate skills in observing all regulatory and safety standards.

Industry-based knowledge and skill

Skill Type

AG 06.03 Understand appropriate health and safety emergency procedures for agricultural occupations. **Technical Career Skill**

Performance Indicators

Delivery Level

- AG 06.03.01 Develop a response plan to handle emergencies.
- AG 06.03.01.01 Identify the various requirements of an emergency response plan for a facility.
- AG 06.03.01.02 Develop an emergency response plan for natural disasters.
- AG 06.03.01.03 Develop an emergency response plan for a fire or explosion in a small plant.
- AG 06.03.01.04 Develop an emergency response plan for a flood affecting a farm that houses small animals.

Industry-based knowledge and skill

Skill Type

AG 07.01 Use leadership skills in collaborating with others to accomplish agriculture related organizational goals and objectives. **Technical Career Skill**

Performance Indicators

Delivery Level

- AG 07.01.01 Demonstrate skills that represent key elements of leadership (e.g., empowerment, risk taking, communication, focusing on results, decision-making, problem-solving).
- AG 07.01.01.01 Demonstrate skill in working on projects both independently and in groups.
- AG 07.01.01.02 Identify desired outcomes and develop a plan of focus.
- AG 07.01.01.03 Develop a project plan, including activities, outcomes, timelines, budget and resources, etc.
- AG 07.01.01.04 Create a communication map and timeline.
- AG 07.01.01.05 Evaluate risks and incorporate risk elements after careful consideration.
- AG 07.01.01.06 Demonstrate confidence in others abilities through sharing tasks, considering their ideas and information and allowing them to work with minimum guidance and oversight.
- AG 07.01.01.07 Evaluate mistakes and indicate how these mistakes will influence future planning.
- AG 07.01.01.08 Evaluate action taken and make recommendations for improvements.
- AG 07.01.01.09 Identify methods for managing disappointments or failures.
- AG 07.01.01.10 Identify resources and potential sources.
- AG 07.01.02 Demonstrate human relations team building skills (e.g., empathy for others, service focus, listening, coaching).
- AG 07.01.02.01 Identify and practice key human relations skills in working with others (e.g., trustworthiness, reliability, listening, empathy, compassion).
- AG 07.01.02.02 Identify and practice a variety of communication skills to interact and work with others.
- AG 07.01.02.03 Research and identify methods to develop personal growth skills for all team members (e.g., respect and value others and their ideas, beliefs, cultural perspective, and their inter-generational perspective).
- AG 07.01.02.04 Identify barriers in building relationships and develop strategies to overcome these barriers and work cooperatively.
- AG 07.01.02.05 Demonstrate team building skills (e.g., empathy for others, service focus, listening, coaching).
- AG 07.01.02.06 Identify and practice methods to show appreciation to others for team member contributions.

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Performance Indicators

Delivery Level

AG 07.01.02.07	Identify examples of stewardship in leadership and discuss how these examples relate to today's leaders.
AG 07.01.03	Identify the skills of dynamic leaders and develop a plan to acquire those skills which coordinate with personal goals.
AG 07.01.03.01	Research and identify the unique skills/attributes of key leaders within an agricultural business or industry.
AG 07.01.03.02	Identify and demonstrate skills of persuasion and securing a commitment (e.g., securing a commitment to perform the agreed upon tasks identified in a project planning group).
AG 07.01.03.03	Demonstrate skill in evaluating risks and making a plan of action.
AG 07.01.03.04	Identify skills/attributes that qualify a person to serve as an agent of change.
AG 07.01.03.05	Identify methods to evaluate and accommodate opportunities and obstacles.
AG 07.01.03.06	Identify the skills/attributes and circumstances needed to conceptualize ideas.
AG 07.01.03.07	Identify steps to create a personal network for occupational/career needs.
AG 07.01.03.08	Develop a library of current reading materials relating to innovation and leadership.
AG 07.01.03.09	Demonstrate understanding of essential social graces and courtesies (e.g., table etiquette, handshakes, introductions, thank-you notes).
AG 07.01.04	Use extended learning activities (e.g., educational competitions, club/volunteer activities and project teams, to demonstrate leadership and project team skills).
AG 07.01.04.01	Clarify roles for partners who serve as both leaders and followers.
AG 07.01.04.02	Identify team goals.
AG 07.01.04.03	Identify team values and cooperative work practices.
AG 07.01.04.04	Demonstrate negotiating/facilitation skills to determine work assignments.
AG 07.01.04.05	Develop a Gant Chart or other visual to identify timelines for completion of project or tasks.
AG 07.01.04.06	Identify communication procedures and protocol.
AG 07.01.04.07	Identify procedures for evaluation of progress and outcomes.
AG 07.01.05	Identify the personal skills and attributes important in personal life and career goals and demonstrate/practice/refine these skills in an educational, family, workplace or community setting.
AG 07.01.05.01	Identify personal skills/attributes to acquire and hone (e.g., coping skills, time management skills, life long learning, study skills, compassion, self confidence, integrity, self-reflection, managing anxiety, healthy diet and exercise management).
AG 07.01.05.02	Identify methods for teaching and practicing personal skills/ attributes in a variety of settings.
AG 07.01.05.03	Develop a self-assessment tool to monitor progress in skill/attribute improvement.
AG 07.01.05.04	Keep a journal of personal activities, decisions, outcomes and self-reflection.
AG 07.01.05.05	Participate in a learning style self-assessment and identify how these skills/attributes affect and influence daily performance.
AG 07.01.05.06	Conduct a 360 self- assessment using associates and leaders in the school or the workplace, to understand how others perceive personal leadership and team skills.
AG 07.01.06	Identify methods to consider and respect all partners in the larger agricultural global workplace.
AG 07.01.06.01	Contribute to solving issues important to the community (e.g., conduct research, distribute accurate information, submit letters to editors, facilitate discussion groups).

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Performance Indicators

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AG 07.01.06.02	Perform leadership tasks associated with citizenship (e.g., voting, debate, public forums, community beautification/restoration projects).
AG 07.01.06.03	Research trends and issues and apply knowledge to an agricultural decision making project.
AG 07.01.06.04	Demonstrate understanding of key local, state, nation and global agricultural issues.
AG 07.01.06.05	Define methods and techniques that promote understanding of diversity (e.g., comparing similar customs and practices; learning a second language).

Industry-based knowledge and skill

Skill Type

AG 08.01 Know and understand the importance of professional ethics and legal responsibilities in agricultural careers.

Technical Career Skill

Performance Indicators

Delivery Level

AG 08.01.01	Demonstrate knowledge of professional and workplace ethics and legal responsibilities and develop guidelines for workplace conduct.
AG 08.01.01.01	Develop a list of legal responsibilities for different roles and functions within an organization.
AG 08.01.01.02	Access appropriate resources to recognize and verify differences in ethical and legal responsibilities.
AG 08.01.02	Use reasoning and problem-solving skills to assess ethical behavior in the agricultural workplace.
AG 08.01.02.01	Use problem mapping to identify pros and cons/ risks and liabilities to develop skills in ethical/legal reasoning and decision-making.
AG 08.01.02.02	Identify strategies for responding to unethical or illegal actions of individuals and organizations.
AG 08.01.02.03	Develop a plan to manage a resolution to a specific legal or ethical workplace issue.
AG 08.01.02.04	Evaluate the outcome(s) and impact of the legal or ethical problem resolution.
AG 08.01.02.05	Create a guidebook for an agricultural workplace for legal and ethical decision-making.
AG 08.01.03	Identify the entities that regulate agricultural legal and ethical decisions in an agricultural career or business.
AG 08.01.03.01	Identify the legal bodies that regulate the desired career locally, state and nationally.
AG 08.01.03.02	Identify national and international regulations that affect day-to-day operations in a desired career using library and Internet resources.
AG 08.01.03.03	Review appropriate resources to identify national and international rules associated with a desired agricultural business or industry.
AG 08.01.04	Develop a tool to assess ethical behavior in the workplace and identify how this behavior plays an integral role in all business.
AG 08.01.04.01	Observe and evaluate an ethical problem solving event in a workplace environment.
AG 08.01.04.02	Identify personal guidelines for managing personal/client relationships in the workplace.
AG 08.01.05	Demonstrate stewardship and ethical behavior within an agricultural business or industry.
AG 08.01.05.01	Explain how personal choices impact agricultural systems sustainability.
AG 08.01.05.02	Identify personal habits and actions that demonstrate workplace ethics.
AG 08.01.05.03	Identify and assess personal behavior relating to legal and ethical issues in agricultural management.
AG 08.01.05.04	Identify key laws and regulations within an agricultural system that may appear contrary to the benefit of business, industry, landowner, etc. and identify the legal and ethical implications.

Cluster Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: **Agriculture**

Performance Indicators

Delivery Level

- AG 08.01.05.05 Locate three new laws or regulations affecting a business or industry and identify the stewardship or ethical dilemma(s) and/or opportunities.
- AG 08.01.05.06 Develop a matrix to illustrate the essential elements of the law/regulation, the key stakeholders, the potential effect on each stakeholder and the cause and effect relationships of decisions.
- AG 08.01.05.07 Develop a policy paper that proposes a new law/regulation that protects the general public's resources as well as an agricultural industry (e.g., management of Oregon's wilderness).

Industry-based knowledge and skill

Skill Type

AG 08.03 Compare and contrast issues that affect technical fields in an Oregon agriculture industry (e.g., biotechnology, employment, safety, environmental quality, animal welfare). **Technical Career Skill**

Performance Indicators

Delivery Level

- AG 08.03.01 Identify, analyze and present solutions for different broad impact issues relating to a technical field in an Oregon agricultural business or industry.
- AG 08.03.01.01 Identify the key issues affecting the industry.
- AG 08.03.01.02 Research and document key history and policies related to the issue(s).
- AG 08.03.01.03 Identify the key stakeholders or players affected by the issue.
- AG 08.03.01.04 Compare and contrast conflicting points of view regarding the issue(s).
- AG 08.03.01.05 Forecast the effects of the issue on the industry.
- AG 08.03.01.06 Propose potential resolutions to the issue(s).

Industry-based knowledge and skill

Skill Type

AG 09.01 Know and understand the importance of employability skills for agricultural careers. **Technical Career Skill**

Performance Indicators

Delivery Level

- AG 09.01.01 Apply critical thinking skills and decision-making to demonstrate qualifications for entering a career.
- AG 09.01.01.01 Explain written organizational policies, rules and procedures to guide employees in workplace behavior.
- AG 09.01.01.02 Identify and demonstrate positive work behaviors and personal qualities desired by most employers.
- AG 09.01.01.03 Demonstrate the relevance of critical thinking skills in decision making, creativity and quality performance in the workplace.
- AG 09.01.02 Identify career opportunities to help develop career plans.
- AG 09.01.02.01 Research and identify career opportunities in one or more career focus areas to discover personal preferences.
- AG 09.01.02.02 Use the Oregon Comprehensive Guidance and Counseling Framework to identify skills, experiences and ultimately, a career plan.
- AG 09.01.02.03 Interview an employer to identify the employer perspective of skills needed for this specific occupation or industry.
- AG 09.01.03 Identify how advances in technology affect the need for continuing education and/or career development.
- AG 09.01.03.01 To be defined
- AG 09.01.03.02 To be defined

Industry-based knowledge and skill

Skill Type

AG 10.01 Demonstrate knowledge and skills related to critical technological systems (e.g., design, operation and maintenance for use in agriculture businesses and industries). **Technical Career Skill**

Performance Indicators

Delivery Level

- AG 10.01.01 Identify the use of key technological systems including transportation.
- AG 10.01.01.01 Evaluate transportation needs and identify the critical role and function of transportation-related technological systems.

Cluster Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: **Agriculture**

Performance Indicators

Delivery Level

AG 10.01.01.02	Assess the reliability and performance of technological equipment or system and its relationship to business efficiency and productivity.
AG 10.01.01.03	Use assessment information to establish maintenance and use guidelines for technical systems.
AG 10.01.01.04	Identify major health, safety and environmental risks that may affect technological systems.
AG 10.01.01.05	Develop and implement a plan to manage major risks to technological systems (e.g., health, safety or environmental).
AG 10.01.02	Select and improve utilization of technological systems to improve production.
AG 10.01.02.01	Develop acceptable criteria to evaluate and select technological systems.
AG 10.01.02.02	Provide evidence (e.g., plans or work record that demonstrate efforts to improve performance of technological systems).
AG 10.01.03	Identify the technical skills required to efficiently run a business or industry within the field of agriculture.
AG 10.01.03.01	Demonstrate correct operation of the tools associated with a specific skill(s) or task(s) (e.g., use a calibrator to manage spray flow in pesticide application).
AG 10.01.03.02	Identify the types of technical skills needed to succeed in a desired industry (e.g., use a GPS for identifying locations for timber cruising).
AG 10.01.03.03	Identify the focus areas/methods/avenues to develop technical skills.
AG 10.01.04	Establish criteria or methods to identify career areas within agriculture that have specific needs for technical skills.
AG 10.01.04.01	Classify workplace occupations to determine what types of skills are considered technical skills.
AG 10.01.04.02	Evaluate specific processes or products to determine what technical skills are most often required for employment.
AG 10.01.04.03	Identify avenues of education and/or methods necessary to achieve the industry specific technical skills.

Industry-based knowledge and skill

Skill Type

AG 10.02 Use tools, equipment, machinery and technology to work in areas related to agriculture. **Technical Career Skill**

Performance Indicators

Delivery Level

AG 10.02.01	Select the appropriate tool to perform a given task.
AG 10.02.01.01	Select tools and equipment for a project.
AG 10.02.01.02	Identify standard tools, equipment and related safety procedures.
AG 10.02.01.03	Demonstrate use of operating instructions.
AG 10.02.01.04	Demonstrate the set up and adjustment of tools and equipment.
AG 10.02.01.05	Demonstrate proper tool storage.
AG 10.02.01.06	Demonstrate how to check tool(s) condition before use.
AG 10.02.02	Maintain tools for efficient work use.
AG 10.02.02.01	Describe the characteristics of a tool in need of maintenance.
AG 10.02.02.02	Demonstrate how to replace tool parts and components as needed.
AG 10.02.02.03	Develop and maintain a preventive maintenance schedule.
AG 10.02.02.04	Maintain equipment according to owner's manual specifications.
AG 10.02.02.05	Maintain and repair a pump or a similar piece of equipment.
AG 10.02.03	Demonstrate the safe use of tools, equipment and vehicles, including the use of protective clothing.
AG 10.02.03.01	Wear appropriate personal protective equipment (Personal Protective Equipment (PPE)).
AG 10.02.03.02	Demonstrate proper spacing and distance from others when using tools.
AG 10.02.03.03	Demonstrate tool safety check for proper working order before using.
AG 10.02.03.04	Demonstrate the safe use of a tool or piece of equipment.

Cluster Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: **Agriculture**

Performance Indicators

Delivery Level

AG 10.02.03.05	Describe the safety regulations associated with specific tools and equipment.
AG 10.02.03.06	Identify the proper and safe use of a variety of vehicles (e.g., pick-up trucks, four wheel drive vehicles, front-end loaders, excavators, cranes, watercraft).
AG 10.02.03.07	Operate selected vehicles demonstrating safety precautions (e.g., pick-up trucks, four wheel drive vehicles, front-end loaders, excavators, cranes, watercraft).
AG 10.02.03.08	Demonstrate the appropriate use and safe operation of pumps (e.g., diesel and gas engines, centrifugal pumps, positive displacement pumps, air and gas compressors).
AG 10.02.03.09	Demonstrate the appropriate use and safe operation of applicable miscellaneous equipment (e.g., hoists, winches, pulleys, boilers, irrigation and drilling, and associated equipment).
AG 10.02.04	Use tools to demonstrate the use of technology to expand human capacity.
AG 10.02.04.01	Use appropriate tools correctly for lifting and handling (e.g., forklifts, cranes, come a longs, chain falls, jacks).
AG 10.02.04.02	Demonstrate the use of knots, lines and attachments for rigging and moving (e.g., equipment, products).
AG 10.02.04.03	Use geo-spatial and mapping techniques (GIS/GPS) for agricultural work (e.g., locating field coordinates for crop planting).

Industry-based knowledge and skill

Skill Type

AG 11.01 Use economic principles to manage agriculture resources and produce products. **Technical Content Skill**

Performance Indicators

Delivery Level

AG 11.01.01	Identify key economic principles and relate them to agricultural systems (e.g., supply and demand).
AG 11.01.01.01	Define compound interest and explain its effect on agricultural investments.
AG 11.01.01.02	Describe the economic impacts of agricultural/natural resource preservation in contrast to use of the resource.
AG 11.01.01.03	Identify potential entrepreneurial opportunities in natural resources.
AG 11.01.01.04	Describe the impacts of significant agricultural management decisions on global markets.
AG 11.01.01.05	Describe key economic principles (e.g., supply and demand, and relate their effect on natural resources economic and workforce systems).

Industry-based knowledge and skill

Skill Type

AG 11.02 Forecast the influence of emerging technology on widespread agricultural markets. **Technical Content Skill**

Performance Indicators

Delivery Level

AG 11.02.01	Research new technologies and project their impact in a global market.
AG 11.02.01.01	Identify global regulations related to new technology and explain how they impact system changes.
AG 11.02.01.02	Identify and discuss how new technologies (e.g., lasers and robotics, are impacting agricultural systems).

Industry-based knowledge and skill

Skill Type

AGS10.04 Forecast the influence of emerging technology on widespread agricultural markets. **Technical Content Skill**

Performance Indicators

Delivery Level

AGS10.04.01.00	Research new technologies and project their impact in a technology based global market.	High School
AGS10.04.01.01	Identify global regulations related to new technology and explain how they impact system changes.	Community College

Cluster Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: *Ag, Food and Natural Resource Systems*

 Cluster: **Agriculture**

Performance Indicators

Delivery Level

AGS10.04.01.02	Identify and discuss how new technologies (e.g., lasers and robotics, are impacting agricultural systems).	Community College
AGS10.04.02.00	Identify how advances in technology affect the need for continuing education and/or career development.	Community College

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Agribusiness**

Industry-based knowledge and skill

Skill Type

ABM 01. Utilize economic principles to establish and manage an Agriculture enterprise.

Performance Indicators

Delivery Level

ABM 01.01.	Apply principles of capitalism in the business environment.
ABM 01.01.01.a.	Recognize principles of capitalism as related to Agriculture businesses.
ABM 01.01.01.b.	Differentiate types of ownership and outline the structure of Agriculture businesses in a capitalistic economic system.
ABM 01.01.01.c.	Execute supply-and-demand principles in Agriculture businesses.
ABM 01.02.	Apply principles of entrepreneurship in businesses.
ABM 01.02.01.a.	Describe the meaning, importance and economic impact of entrepreneurship.
ABM 01.02.01.b.	Classify the characteristics of successful entrepreneurs in Agriculture businesses.
ABM 01.02.01.c.	Demonstrate entrepreneurship, including idea generation, opportunity analysis and risk assessment.
ABM 01.03.	Identify various business structures as they pertain to the agriculture industry (Co-op, Sole Proprietorship, LLC., Corporation, Etc.)
ABM 01.03.01.a.	To be defined
ABM 01.03.01.b.	To be defined
ABM 01.03.01.c.	To be defined
ABM 01.04.	Explain national and global market trends and principles as they relate to local agricultural enterprises.
ABM 01.04.01.a.	To be defined
ABM 01.04.01.b.	To be defined
ABM 01.04.01.c.	To be defined

Industry-based knowledge and skill

Skill Type

ABM 02. Utilize appropriate management planning principles in Agriculture business enterprises.

Technical Content Skill

Performance Indicators

Delivery Level

ABM 02.01.	Compose and analyze a business plan for an enterprise.
ABM 02.01.01.a.	Recognize quality Agriculture business plan components that have been developed using the SMART (specific, measurable, attainable, realistic and timely) format.
ABM 02.01.01.b.	Identify components of business plans and demonstrate how to write such components using the SMART format.
ABM 02.01.01.c.	Prepare and critique Agriculture business plans.
ABM 02.01.02.a.	Identify and observe ethical standards in planning and operating Agriculture businesses.
ABM 02.01.02.b.	Observe appropriate laws and regulations in planning and operating Agriculture businesses.
ABM 02.01.02.c.	Utilize methods of Agriculture business enterprise analysis, such as SWOT (strengths, weaknesses, opportunities and threats).
ABM 02.02.	Read, interpret, evaluate and write a mission statement to guide business goals, objectives and resource allocation.
ABM 02.02.01.a.	Read and interpret mission statements.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Agribusiness**

Performance Indicators

Delivery Level

ABM 02.02.01.b.	Identify approaches in creating mission statements for Agriculture businesses.
ABM 02.02.01.c.	Create and disseminate a mission statement for business activities in Agriculture.
ABM 02.02.02.a.	Identify the meaning and importance of goals and objectives in Agriculture business enterprises.
ABM 02.02.02.b.	Prepare short-term, intermediate and long-term goals and objectives that are consistent with the mission statement for an Agriculture business.
ABM 02.02.02.c.	Evaluate Agriculture business goals and objectives and make revisions based on observations.
ABM 02.03.	Apply appropriate management skills to organize a business.
ABM 02.03.01.a.	Identify organizational structures and chains of command in Agriculture businesses.
ABM 02.03.01.b.	Identify management types in Agriculture businesses.
ABM 02.03.01.c.	Implement management approaches to assure efficiency and profitability.
ABM 02.03.02.a.	Identify appropriate local, state, federal, international and industry regulations for Agriculture businesses.
ABM 02.03.02.b.	Prepare and deliver Agriculture business presentations that include customers served, sources of inputs and how a business produces goods and services.
ABM 02.03.02.c.	Create an organizational chart for an Agriculture business.
ABM 02.04.	Recruit, train and retain appropriate and productive human resources for businesses.
ABM 02.04.01.a.	Identify the meaning and functions of human resources in Agriculture businesses.
ABM 02.04.01.b.	Determine appropriate human resources for Agriculture businesses.
ABM 02.04.01.c.	Write job descriptions for specific positions in an Agriculture business.
ABM 02.04.02.a.	Identify usual employee benefits in Agriculture businesses.
ABM 02.04.02.b.	Design a career development and training plan for employees of an Agriculture business.
ABM 02.04.02.c.	Create a recruitment and evaluation program for employees in an Agriculture business.
ABM 02.04.03.a.	Explain the meaning and importance of employee relations, including communication.
ABM 02.04.03.b.	Establish and maintain appropriate records and reports on human resources.
ABM 02.04.03.c.	Determine and follow appropriate regulations in recruiting, hiring and promoting personnel.
ABM 02.04.04.a.	Identify the meaning and nature of employee compensation.
ABM 02.04.04.b.	Design a legally compliant and competitive compensation plan for Agriculture business employees.
ABM 02.04.04.c.	Devise a compensation plan to equitably compensate, motivate and recognize productivity of human resources.

Industry-based knowledge and skill

Skill Type

ABM 03. Utilize record keeping to accomplish Agriculture business objectives while complying with laws and regulations. **Technical Content Skill**

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Agribusiness**

Performance Indicators

Delivery Level

- ABM 03.01. Prepare and maintain all files needed to accomplish effective record keeping.
- ABM 03.01.01.a. Maintain production and agribusiness records.
- ABM 03.01.01.b. Analyze records to improve efficiency and profitability of an Agriculture business.
- ABM 03.01.01.c. Apply management information systems in Agriculture business financial analysis.
- ABM 03.02. Implement appropriate inventory management practices.
- ABM 03.02.01.a. Monitor inventory to maintain optimal levels and calculate costs of carrying input and output inventory.
- ABM 03.02.01.b. Use computer technology in inventory management and reporting, including spreadsheets, databases, word processing, networked systems and the Internet.
- ABM 03.02.01.c. Apply logistics management strategies.

Industry-based knowledge and skill

Skill Type

ABM 04. Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets and credit for Agriculture businesses. **Technical Content Skill**

Performance Indicators

Delivery Level

- ABM 04.01. Use accounting fundamentals to accomplish dependable bookkeeping and fiscal management.
- ABM 04.01.01.a. Budget resources, as applied to the Agriculture business, including capital, human, financial and time.
- ABM 04.01.01.b. Manage assets, including credit, for agribusiness goal achievement.
- ABM 04.01.01.c. Manage resources to minimize liabilities and maximize profit.
- ABM 04.01.02.a. Identify financial concepts associated with production and profit.
- ABM 04.01.02.b. Use accounting information to estimate the cost of goods sold and margins on the goods.
- ABM 04.01.02.c. Evaluate characteristics of lines of credit, loan terms and alternatives in sources of capital.
- ABM 04.01.03.a. Explain the importance of return on investment for an agribusiness enterprise.
- ABM 04.01.03.b. Analyze reporting requirements for income, property and employment taxes associated with small Agriculture businesses.
- ABM 04.01.03.c. Utilize accountants in Agriculture business management.

Industry-based knowledge and skill

Skill Type

ABM 05. Assess accomplishment of goals and objectives by an Agriculture business.

Performance Indicators

Delivery Level

- ABM 05.01. Maintain and interpret financial information (income statements, balance sheets, inventory, purchase orders, accounts receivable and cash-flow analyses) for businesses.
- ABM 05.01.01.a. Identify accounting information in Agriculture business reporting and management.
- ABM 05.01.01.b. Maintain accounting information needed to prepare an income statement, balance sheet and cash-flow analysis for an Agriculture business.
- ABM 05.01.01.c. Interpret financial information for an Agriculture business to determine profitability, net worth position, financial ratios, performance measures and ability to meet cash-flow requirements.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Agribusiness**

Performance Indicators

Delivery Level

ABM 05.01.02.a.	Name and explain the impact of external economic factors on an Agriculture business.
ABM 05.01.02.b.	Recognize how changes in prices of inputs and/or outputs influence the financial statements of an Agriculture business.
ABM 05.01.02.c.	Predict the consequences of delayed payment of expenses, prepayment of expenses and delayed receipts on a financial statement.
ABM 05.01.03.a.	Identify information needed for an Agriculture business manager to monitor performance on a daily, weekly, monthly, quarterly and annual basis.
ABM 05.01.03.b.	Interpret business performance data.
ABM 05.01.03.c.	Conduct a breakeven analysis for an Agriculture business.
ABM 05.01.04.a.	Calculate percentages, ratios and related business applications.
ABM 05.01.04.b.	Summarize financial data for use in preparing various business financial statements.
ABM 05.01.04.c.	Interpret and evaluate financial statements, including income statements, balance sheets and cash-flow analyses.
ABM 05.01.05.a	Apply the time value of money concepts to include a growing income stream to a Agriculture business
ABM 05.01.05.b	Define the time value of money concepts to include a growing income stream
ABM 05.01.05.c	Determine if the time value of money concept is appropriate for an Agriculture business

Industry-based knowledge and skill

Skill Type

ABM 06. Use industry-accepted marketing principles to accomplish Agriculture business objectives.

Technical Content Skill

Performance Indicators

Delivery Level

ABM 06.01.	Conduct appropriate market and marketing research.
ABM 06.01.01.a.	Investigate the meaning and methods of marketing in Agriculture as related to agricultural commodities, products and services and to agricultural goods in domestic and international markets.
ABM 06.01.01.b.	Apply benefit/cost analysis to marketing in Agriculture businesses.
ABM 06.01.01.c.	Implement and evaluate marketing strategies with agricultural commodities, products and services.
ABM 06.01.02.a.	Describe functions in agricultural marketing.
ABM 06.01.02.b.	Assess the presence of marketing infrastructure for agricultural commodities.
ABM 06.01.02.c.	Evaluate alternative marketing strategies, such as value-adding, branding and niche marketing, and propose and implement appropriate modifications to achieve Agriculture business goals.
ABM 06.02.	Develop a marketing plan.
ABM 06.02.01.a.	Identify the purpose, components and developmental processes of marketing plans.
ABM 06.02.01.b.	Perform a marketing analysis, including evaluation of the competitors, customers, international and domestic policy environment, regulations and rules, standards and Agriculture business resources.
ABM 06.02.01.c.	Establish marketing plan goals/objectives, including monitoring, measuring and analyzing goal achievement.
ABM 06.03.	Develop strategies for marketing plan implementation.
ABM 06.03.01.a.	Identify and use strategies frequently employed in marketing programs, including those used in niche markets.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Agribusiness**

Performance Indicators

Delivery Level

ABM 06.03.01.b.	Determine marketing strategies that are most likely to be effective in an Agriculture business.
ABM 06.03.01.c.	Revise marketing strategies based on monitoring and measurement information for target customer base.
ABM 06.04.	Develop specific tactics to market Agriculture products and services.
ABM 06.04.01.a.	Explain the meaning and use of the four P's (product, place, price and promotion) in marketing.
ABM 06.04.01.b.	Develop advertising campaigns that promote products and services.
ABM 06.04.02.a.	Evaluate the effectiveness of a given marketing plan.
ABM 06.04.02.b.	Implement sales goals and incentive programs, and identify pricing strategies used by competitors.
ABM 06.05.	Merchandise products and services to achieve specific marketing goals.
ABM 06.05.01.a.	Identify, explain and organize components of the sales process.
ABM 06.05.01.b.	Develop effective customer relationships using approaches that are consistent and comprehensive.
ABM 06.05.01.c.	Monitor marketing approaches to determine effectiveness in goal achievement, and make needed changes in such approaches.
ABM 06.05.02.a.	Develop strategies to gain new customers.
ABM 06.05.02.b.	Devise sales practices to achieve goals effectively and efficiently.
ABM 06.05.02.c.	Prepare and make sales presentations.
ABM 06.05.03.a.	Identify and maintain needed sales records.
ABM 06.05.03.b.	Use strategies to follow up sales to provide post-sales service.
ABM 06.05.03.c.	Intercept, interpret and process customer complaints, needs and problems with products and services.

Industry-based knowledge and skill

Skill Type

ABM 07. Create a production system plan.

Performance Indicators

Delivery Level

ABM 07.01.	Prepare a step-by-step production and operational plan that identifies needed resources.
ABM 07.01.01.a.	Prepare a flowchart that shows production processes, including the resources needed for each step.
ABM 07.01.01.b.	Identify and assess alternative production systems and ways products can be produced.
ABM 07.01.01.c.	Adapt production processes based on changing product characteristics.
ABM 07.02.	Develop a production and operational plan.
ABM 07.02.01.a.	Identify the components of a production and operational plan.
ABM 07.02.01.b.	Evaluate the components of a production and operational plan and then revise an existing plan.
ABM 07.02.01.c.	Develop and implement a product supply and distribution plan that meets the goals and objectives of an Agriculture business.
ABM 07.02.02.a.	Identify common resources needed to operate a production facility.
ABM 07.02.02.b.	Examine legal and industry requirements for a production facility.
ABM 07.02.02.c.	Develop a production facility plan that includes building, equipment, personnel, utilities and logistics components.
ABM 07.03.	Utilize appropriate techniques to determine the most likely strengths, weaknesses and inconsistencies in a business plan and relate these to risk management strategies.
ABM 07.03.01.a.	Examine a business plan to identify inconsistencies and actions to correct inconsistencies.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: *Ag, Food and Natural Resource Systems*

 Cluster: *Agriculture*

 Focus Area: ***Agribusiness***

Performance Indicators

Delivery Level

ABM 07.03.01.b.	Describe approaches to use in revising a business plan for improved consistency and realism.
ABM 07.03.01.c.	Revise business plans as needed to assure internal consistency.
ABM 07.04.	Demonstrate the components of risk management
ABM 07.04.01.a.	Determine the meaning and importance of risk and uncertainty with Agriculture enterprises.
ABM 07.04.01.b.	Describe alternative approaches to reducing risk, including the use of insurance for product liability, property, production or income loss and for personnel life and health.
ABM 07.04.01.c.	Prepare a comprehensive risk management and contingency plan for an Agriculture business.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Power, Structure and Technology**

Industry-based knowledge and skill

Skill Type

PST 01. Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.

Performance Indicators

Delivery Level

PST 01.01.	Select energy sources in power generation appropriate to the situation.
PST 01.01.01.a.	Identify renewable and nonrenewable energy sources and pathways of delivery.
PST 01.01.01.b.	Examine environmental impacts and efficiencies of energy sources.
PST 01.01.01.c.	Compare the efficiency of energy production from various sources.
PST 01.02.	Apply physical science laws and principles to identify, classify and use lubricants.
PST 01.02.01.a.	Classify lubricants by source, sustainability and equipment compatibility.
PST 01.02.01.b.	Classify lubricants by SAE viscosity and API service classifications.
PST 01.02.01.c.	Select, use and dispose of lubricants.
PST 01.03.	Identify and use hand and power tools and equipment for service, construction and fabrication.
PST 01.03.01.a.	Identify and demonstrate safe use and maintenance of measurement and layout tools.
PST 01.03.01.b.	Select, maintain and use hand and power tools in service, construction and fabrication.
PST 01.03.01.c.	Assess the performance of employees in use of hand and power tools to safely and efficiently service, construct and fabricate quality products.
PST 01.04.	Identify and explain different transmission types (hydraulic, electrical, performance, power transmission, pneumatic, HVAC).
PST 01.04.01.a	Compare and contrast the different applications of each for each transmission type (hydraulic, electrical, performance, power transmission, pneumatic, HVAC).

Industry-based knowledge and skill

Skill Type

PST 02. Plan, operate, maintain and troubleshoot mechanical equipment, structures, biological systems, land treatment, power and technology.

Performance Indicators

Delivery Level

PST 02.01.	Perform service routines to maintain power units and equipment.
PST 02.01.01.a.	Identify and schedule power unit and equipment lubrication.
PST 02.01.01.b.	Ensure the presence and function of safety systems and hardware on tools and equipment.
PST 02.01.01.c.	Test and service electrical systems.
PST 02.01.02.a.	Service filtration systems and maintain fluid levels on power units and equipment.
PST 02.01.02.b.	Adjust equipment, including belts and drives, chains and sprockets, and maintain fluid conveyance components, such as hoses, lines and nozzles.
PST 02.01.02.c.	Troubleshoot malfunctions and failures in equipment using computer and on-board diagnostics.
PST 02.01.03.a.	Maintain the cleanliness and appearance of power units and equipment to assure functionality.
PST 02.01.03.b.	Develop a preventive maintenance schedule for power units and equipment.
PST 02.01.03.c.	Maintain and calibrate metering, monitoring and sensing devices on equipment.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Power, Structure and Technology**

Performance Indicators

Delivery Level

PST 02.02.	Operate, service and diagnose the condition of power units and equipment.
PST 02.02.01.a.	Identify power unit and equipment controls and instruments, along with their functions.
PST 02.02.01.b.	Perform start-up and shut-down procedures on power units and equipment as specified in technical manuals.
PST 02.02.01.c.	Select power units and equipment for operational efficiencies.
PST 02.02.02.a.	Perform pre-operation inspection according to manufacturers' specifications and/or prevailing industry standards.
PST 02.02.02.b.	Demonstrate safe practices and regulations in the operation of power units and equipment.
PST 02.02.02.c.	Adjust equipment for safe and efficient operation.

Industry-based knowledge and skill

Skill Type

PST 03. Service and repair mechanical equipment and power systems.

Performance Indicators

Delivery Level

PST 03.01.	Troubleshoot and repair internal combustion engines.
PST 03.01.01.a.	Identify components and systems of internal combustion engines.
PST 03.01.01.b.	Utilize technical manuals and computer-based diagnostics in engine analysis and repair.
PST 03.01.01.c.	Performance test internal combustion engines to determine service and repair needs.
PST 03.01.02.a.	Describe the operation of internal combustion engines by types of fuel used.
PST 03.01.02.b.	Analyze and troubleshoot internal combustion engines.
PST 03.01.02.c.	Overhaul spark-and-compression internal combustion engines.
PST 03.02.	Utilize manufacturers' guidelines to service and repair the power transmission systems of equipment.
PST 03.02.01.a.	Identify and describe applications of simple machines in power systems.
PST 03.02.01.b.	Identify and compare operation principles and features, benefits and applications of various power transmission systems.
PST 03.02.01.c.	Use speed, torque and power measurements to improve efficiency in power transmission systems.
PST 03.02.02.a.	Calculate mechanical advantage in mechanical systems.
PST 03.02.02.b.	Describe features, benefits and applications of mechanical transmission components, including belts, chains, gears, bearings, seals, universals and drive shafts.
PST 03.02.02.c.	Inspect, analyze and repair hydrostatic transmissions.
PST 03.02.03.a.	Identify power transfer principles, including those using friction, gears and fluids.
PST 03.02.03.b.	Inspect, analyze and repair clutches and brakes.
PST 03.02.03.c.	Inspect, analyze and repair differentials, final drives, transmissions (including gear-type and power-shift transmissions) and auxiliary drives.
PST 03.03.	Service and repair hydraulic and pneumatic systems.
PST 03.03.01.a.	Describe features, benefits and applications of common types of hydraulic and pneumatic systems.
PST 03.03.01.b.	Describe principles of hydraulic and pneumatic system operation.
PST 03.03.01.c.	Utilize symbols and schematic drawings in the maintenance of hydraulic and pneumatic systems.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Agriculture**

 Focus Area: **Power, Structure and Technology**

Performance Indicators

Delivery Level

PST 03.03.02.a.	Apply hydrostatic and hydrodynamic principles in hydraulics and pneumatics, including Archimedes' principle and Pascal's law.
PST 03.03.02.b.	Identify major components of hydraulic and pneumatic systems and describe their use.
PST 03.03.02.c.	Inspect, analyze and repair hydraulic and pneumatic system components, including fluid and compressed-air conveyance components.
PST 03.03.03.a.	Evaluate hydraulic and pneumatic system functionality.
PST 03.03.03.b.	Identify hydraulic and pneumatic system fittings and ports.
PST 03.03.03.c.	Use a pressure-and-flow tester in diagnosing malfunctions and repairing hydraulic and pneumatic systems.
PST 03.04.	Troubleshoot and service electrical systems.
PST 03.04.01.a.	Apply the meaning and measurement of electricity, including amperage, voltage and wattage.
PST 03.04.01.b.	Assess and install electrical circuits, including conductors, insulators and controls.
PST 03.04.01.c.	Evaluate power unit and equipment electrical systems, including ignition, lighting, auxiliary and electronic braking.
PST 03.04.02.a.	Identify the kinds and applications of electricity, including direct and alternating current.
PST 03.04.02.b.	Interpret electrical system symbols and diagrams.
PST 03.04.02.c.	Assess and repair malfunctioning electrical systems and components, such as battery, lighting, instrumentation and accessories.
PST 03.04.03.a.	Discuss various types and sources of electricity.
PST 03.04.03.b.	Use volt and amp meters and continuity testers to demonstrate electricity principles.
PST 03.04.03.c.	Locate and use electrical codes and regulations.
PST 03.04.04.a.	Recognize common electrical symbols.
PST 03.04.04.b.	Read and design schematic drawings for an electrical control system.
PST 03.04.04.c.	Identify and use electrical control system components, including transistors, relays, HVAC and logic controllers.
PST 03.04.05.a.	Identify uses of electrical sensors and controls.
PST 03.04.05.b.	Interpret maintenance schedules for electrical control systems.
PST 03.04.05.c.	Troubleshoot electrical control system performance problems.
PST 03.04.06.a.	Identify hazards and safety practices in planning, installing and using electricity.
PST 03.04.06.b.	Distinguish and select materials and tools used in electrical control circuit installation.
PST 03.04.06.c.	Plan and install electrical control circuits to assure proper operation.
PST 03.04.07.a.	Identify the importance and uses of computer-based systems in agriculture, food and natural resources.
PST 03.04.07.b.	Delineate the functions of programmable logic controllers (PLC) in agricultural production and manufacturing
PST 03.04.07.c.	Develop and implement control systems using programmable logic controllers (PLC) and/or other computer-based systems that operate as specified.
PST 03.04.08.a.	Use common computer-based programs to analyze agricultural data.
PST 03.04.08.b.	Assess database summaries to draw conclusions and propose plans of action.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Power, Structure and Technology**

Performance Indicators

Delivery Level

PST 03.04.08.c.	Use computer-based data acquisition devices and sensors to statistically analyze and interpret data.
PST 03.05.	Service vehicle heating and air-conditioning systems.
PST 03.05.01.a.	Identify principles of heat and temperature measurement.
PST 03.05.01.b.	Describe physical principles of operation of vehicle heating and air-conditioning systems and interpret symbols and diagrams used with such systems.
PST 03.05.01.c.	Troubleshoot, repair and evacuate and charge heating and air-conditioning components, including compressors, expansion valves, receiver dryers, pumps, hoses and recovery tools and systems.
PST 03.06.	Service and repair steering, suspension, traction and vehicle performance systems.
PST 03.06.01.a.	Identify and explain principles of motion, including speed, velocity and acceleration.
PST 03.06.01.b.	Evaluate vehicle traction, ballasting and weight transfer and service as needed.
PST 03.06.01.c.	Evaluate vehicle stability, power-hop, creep-crawl, wheel slip and tractive performance and service as needed.
PST 03.06.02.a.	Identify principles of force on acceleration, including friction and gravity.
PST 03.06.02.b.	Evaluate vehicle performance and then service as needed, including horsepower management, ballasting, soil compaction and fuel efficiency.
PST 03.06.02.c.	Evaluate vehicle suspension and steering systems and service as needed.

Industry-based knowledge and skill

Skill Type

PST 04. Plan, build and maintain agricultural structures.

Performance Indicators

Delivery Level

PST 04.01.	Create sketches and plans of agricultural structures.
PST 04.01.01.a.	Identify symbols and drawing techniques used to develop plans and sketches.
PST 04.01.01.b.	Develop plans and sketches using drafting equipment and computer programs.
PST 04.01.01.c.	Apply principles of design, fabrication and installation of agricultural structures.
PST 04.01.02.a.	Prepare bills of materials to accompany plans and sketches.
PST 04.01.02.b.	Use scale measurement and dimension to develop plans and sketches.
PST 04.01.02.c.	Design functional and efficient facilities for agricultural use.
PST 04.02.	Apply structural plans, specifications and building codes.
PST 04.02.01.a.	Identify major parts of a construction drawing.
PST 04.02.01.b.	Identify and interpret different views of a construction drawing.
PST 04.02.01.c.	Locate, explain and apply elements of a construction drawing.
PST 04.02.02.a.	Identify the sources and importance of industry construction and materials standards, including those of the American National Standards Institute (ANSI) and Underwriters' Laboratories (UL).
PST 04.02.02.b.	Identify local code enforcement agencies and procedures.
PST 04.02.02.c.	Follow local construction and safety codes and specifications in agricultural construction.
PST 04.02.03.a.	Identify design and construction recommendations and practices in agricultural structures.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: *Ag, Food and Natural Resource Systems*

 Cluster: *Agriculture*

 Focus Area: **Power, Structure and Technology**

Performance Indicators

Delivery Level

PST 04.02.03.b.	Read and interpret local structural code information.
PST 04.02.03.c.	Complete appropriate local permit applications for a construction project.
PST 04.03.	Identify and analyze structural requirements for materials and procedures and estimate construction cost.
PST 04.03.01.a.	Identify criteria in selecting materials in agricultural construction/fabrication.
PST 04.03.01.b.	Select types of materials, determine quantities and estimate their costs and other costs associated with a specified project plan.
PST 04.03.01.c.	Prepare a project cost estimate, including materials, labor and management.
PST 04.03.02.a.	Explain the importance and use of requests for construction bids.
PST 04.03.02.b.	Establish business relationships with vendors of materials and services used in agricultural construction.
PST 04.03.02.c.	Prepare a bid package for a planned construction project, including construction timelines, site evaluation, construction plans and related management factors.
PST 04.04.	Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.
PST 04.04.01.a.	Construct and/or repair with wood and metal.
PST 04.04.01.b.	Install and/or repair pipes and plumbing equipment and fixtures.
PST 04.04.01.c.	Evaluate work products or samples for quality and efficiency of workmanship following architectural and mechanical plans.
PST 04.04.02.a.	Identify electricity measurements and make measurement calculations.
PST 04.04.02.b.	Distinguish electrical circuits and components of each.
PST 04.04.02.c.	Install and/or repair electrical wiring components and fixtures following appropriate codes and standards.
PST 04.04.03.a.	Calculate areas and volumes for coatings.
PST 04.04.03.b.	Paint or protect with coatings.
PST 04.04.03.c.	Electroplate or otherwise coat materials.
PST 04.04.04.a.	Calculate efficiencies gained through insulation.
PST 04.04.04.b.	Identify insulation materials and methods to achieve desired R-value.
PST 04.04.04.c.	Insulate a structure.
PST 04.04.05.a.	Measure and calculate materials for concrete, brick, stone or masonry units in agricultural construction.
PST 04.04.05.b.	Construct and/or repair with concrete, brick, stone or masonry units.
PST 04.04.05.c.	Seal, pigment and otherwise prepare concrete, brick, stone or masonry unit surfaces.
PST 04.04.06.a.	Measure and calculate fencing materials.
PST 04.04.06.b.	Construct and/or repair fencing, including wood, static wire, electrical wire and other fencing materials.
PST 04.04.06.c.	Comply with government regulations and applicable fencing and installation codes.
PST 04.04.07.a.	Identify kinds and characteristics of metal materials.
PST 04.04.07.b.	Distinguish welding processes, positions, and materials preparation.
PST 04.04.07.c.	Construct and/or repair metal structures and equipment using welding fabrication procedures, including those associated with SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch methods.
PST 04.04.08.a.	Measure and calculate glass, rigid plastic panels and film plastics for job requirements.
PST 04.04.08.b.	Install glass, ridged plastic panels and/or film plastics.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Power, Structure and Technology**

Performance Indicators

Delivery Level

PST 04.04.08.c. Develop maintenance and service plans for glass, ridged plastic panel, and film plastics installations.

Industry-based knowledge and skill

Skill Type

PST 05. Apply technology principles in the use of agricultural technical systems.

Performance Indicators

Delivery Level

PST 05.01. Apply emerging technology in the use of agricultural systems (i.e. precision agriculture).

PST 05.01.01.a. Identify geospatial technologies, including global positioning, geographical information and remote sensing.

PST 05.01.01.b. Explain and evaluate concepts and principles of geospatial technologies.

PST 05.01.01.c. Assess and install instrumentation and data acquisition systems, including Global Positioning System (GPS) receivers.

PST 05.01.02.a. Explain site-specific agriculture as related to geospatial technologies.

PST 05.01.02.b. Describe equipment and processes used in geospatial technologies.

PST 05.01.02.c. Output and apply maps using GIS/GPS systems.

PST 05.01.03.a. Identify uses, components and setup of precision technology in agriculture, food and natural resources.

PST 05.01.03.b. Describe principles of precision agriculture for map-and sensor-based systems.

PST 05.01.03.c. Demonstrate geospatial applications, including calibration, volumetric controlling and electrical design.

PST 05.01.04.a. Describe the meaning and use of sensors, controllers and actuators.

PST 05.01.04.b. Identify sensor, control, and actuator system components on power units and equipment.

PST 05.01.04.c. Diagnose malfunctions and repair control systems and sensors, including those of engines, transmissions and implements.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Animal Science Systems**

Industry-based knowledge and skill

Skill Type

ANS 01. Examine the components, historical development, global implications and future trends of the animal systems industry.

Performance Indicators

Delivery Level

ANS 01.01. Evaluate the development and implications of animal origin, domestication and distribution.

ANS 01.01.01.a. Identify the origin, significance, distribution and domestication of animal species.

ANS 01.01.01.b. Evaluate and describe characteristics of animals that developed in response to the animals' environment and led to their domestication.

ANS 01.01.01.c. Predict adaptations of animals to production practices and environments.

ANS 01.01.02.a. Define major components of the animal industry.

ANS 01.01.02.b. Outline the development of the animal industry and the resulting products, services and careers.

ANS 01.01.02.c. Predict trends and implications of future development of the animal systems industry.

Industry-based knowledge and skill

Skill Type

ANS 02. Classify, evaluate, select and manage animals based on anatomical and physiological characteristics.

Performance Indicators

Delivery Level

ANS 02.01. Classify animals according to hierarchical taxonomy and agricultural use.

ANS 02.01.01.a. Explain the importance of the binomial system of nomenclature.

ANS 02.01.01.b. Explain how animals are classified using Linnaeus's taxonomical classification system.

ANS 02.01.01.c. Classify animals according to the taxonomical classification system.

ANS 02.01.02.a. Identify major animal species by common and scientific names.

ANS 02.01.02.b. Compare and contrast the hierarchical classification of the major agricultural animal species.

ANS 02.01.02.c. Appraise and evaluate the economic value of animals for various applications in the agriculture industry.

ANS 02.02. Apply principles of comparative anatomy and physiology to uses within various animal systems.

ANS 02.02.01.a. Identify basic characteristics of animal cells, tissues, organs and body systems.

ANS 02.02.01.b. Compare and contrast animal cells, tissues, organs and body systems.

ANS 02.02.01.c. Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.

ANS 02.02.02.a. Diagram a typical animal cell and identify the organelles.

ANS 02.02.02.b. Describe the functions of animal cell structures.

ANS 02.02.02.c. Describe the molecular makeup of animal cells and its importance in animal production and management.

ANS 02.02.03.a. Describe the basic functions of animal cells in growth and reproduction.

ANS 02.02.03.b. Detail the processes of meiosis and mitosis in animal growth, development, health and reproduction.

ANS 02.02.03.c. Explain the application of the processes of meiosis and mitosis to animal growth, development, health and reproduction.

ANS 02.02.04.a. Describe the properties, locations, functions and types of animal tissues.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Animal Science Systems**

Performance Indicators

Delivery Level

ANS 02.02.04.b.	Explain the relationship of animal tissues to growth, performance and health.
ANS 02.02.04.c.	Explain the importance and uses made of animal tissues in the agriculture industry.
ANS 02.02.05.a.	Describe the properties, locations, functions and types of animal organs.
ANS 02.02.05.b.	Compare and contrast organ types and functions among animal species.
ANS 02.02.05.c.	Relate the importance of animal organs to the health, growth and reproduction of animals.
ANS 02.02.06.a.	Describe the functions of the animal body systems and system components.
ANS 02.02.06.b.	Compare and contrast body systems and system adaptations between animal species.
ANS 02.02.06.c.	Explain the impact of animal body systems on performance, health, growth and reproduction.
ANS 02.03.	Select animals for specific purposes and maximum performance based on anatomy and physiology.
ANS 02.03.01.a.	Identify ways an animal's health can be affected by anatomical and physiological disorders.
ANS 02.03.01.b.	Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.
ANS 02.03.01.c.	Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.
ANS 02.03.02.a.	Create a program to develop an animal to its highest potential performance.
ANS 02.03.02.b.	Assess an animal to determine if it has reached its optimal performance level based on anatomical and physiological characteristics.
ANS 02.03.02.c.	Develop efficient procedures to produce consistently high-quality animals, well suited for their intended purposes.

Industry-based knowledge and skill

Skill Type

ANS 03. Provide for the proper health care of animals.

Performance Indicators

Delivery Level

ANS 03.01.	Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.
ANS 03.01.01.a.	Explain methods of determining animal health and disorders.
ANS 03.01.01.b.	Perform simple health-check evaluations on animals.
ANS 03.01.01.c.	Perform diagnostic tests to detect health problems in animals.
ANS 03.01.02.a.	Identify common diseases, parasites and physiological disorders that affect animals.
ANS 03.01.02.b.	Diagnose illnesses and disorders of animals based on symptoms and problems caused by diseases, parasites and physiological disorders.
ANS 03.01.02.c.	Treat common diseases, parasites and physiological disorders of animals.
ANS 03.01.03.a.	Explain characteristics of causative agents and vectors of diseases and disorders in animals.
ANS 03.01.03.b.	Evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Animal Science Systems**

Performance Indicators

Delivery Level

- ANS 03.01.03.c. Design and implement a health maintenance and disease and disorder prevention plan for animals in their natural and/or confined environments.
- ANS 03.01.04.a. Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.
- ANS 03.01.04.b. Prepare animals, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.
- ANS 03.01.04.c. Perform surgical and nonsurgical veterinary treatments and procedures in animal health care.
- ANS 03.01.05.a. Identify and describe zoonotic diseases.
- ANS 03.01.05.b. Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.
- ANS 03.01.05.c. Implement zoonotic disease prevention methods and procedures for the safe handling and treatment of animals.
- ANS 03.02. Provide for the bio-security of agricultural animals and production facilities.
- ANS 03.02.01.a. Explain the importance of bio-security to the animal industry.
- ANS 03.02.01.b. Discuss procedures at the local, state and national levels to ensure bio-security of the animal industry.
- ANS 03.02.01.c. Implement a bio-security plan for an animal production operation.

Industry-based knowledge and skill

Skill Type

ANS 04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.

Performance Indicators

Delivery Level

- ANS 04.01. Explain the essential nutrients (including water) and nutritional needs of species specific animals.
- ANS 04.01.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.
- ANS 04.01.01.b. Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.
- ANS 04.01.01.c. Select appropriate feedstuffs for animals based on factors such as economics, digestive system and nutritional needs.
- ANS 04.01.02.a. Explain the importance of a balanced ration for animals.
- ANS 04.01.02.b. Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and performance.
- ANS 04.01.02.c. Formulate animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.
- ANS 04.02. Prescribe and administer animal feed additives and growth stimulants in animal production.
- ANS 04.02.01.a. Explain the purpose and benefits of feed additives and growth stimulants in animal production.
- ANS 04.02.01.b. Discuss how feed additives and growth stimulants are administered and the precautions that should be taken.
- ANS 04.02.01.c. Prescribe and administer feed additives and growth stimulants.
- ANS 04.02.02.a. Examine the options and cost associated for organic feedstuffs.
- ANS 04.02.02.b. Compare and contrast natural labeled, organic and traditional feedstuffs.
- ANS 04.02.02.c. Develop a balanced rations utilizing natural labeled / organic and traditional feedstuff and determine the feed availability.

Industry-based knowledge and skill

Skill Type

ANS 05.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Animal Science Systems**

Evaluate and select animals based on scientific principles of animal production.

Performance Indicators

Delivery Level

ANS 05.01.	Evaluate the male and female reproductive systems in selecting animals.
ANS 05.01.01.a.	Explain the male and female reproductive organs of the major animal species.
ANS 05.01.01.b.	Describe the functions of major organs in the male and female reproductive systems.
ANS 05.01.01.c.	Select breeding animals based on characteristics of the reproductive organs.
ANS 05.02.	Evaluate animals for breeding readiness and soundness.
ANS 05.02.01.a.	Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals.
ANS 05.02.01.b.	Summarize factors that lead to reproductive maturity.
ANS 05.02.01.c.	Evaluate and select animals for reproductive readiness.
ANS 05.02.02.a.	Discuss the importance of efficient and economic reproduction in animals.
ANS 05.02.02.b.	Evaluate reproductive problems that occur in animals.
ANS 05.02.02.c.	Treat or cull animals with reproductive problems.
ANS 05.03.	Apply scientific principles in the selection and breeding of animals.
ANS 05.03.01.a.	Explain genetic inheritance in agricultural animals.
ANS 05.03.01.b.	Explain the advantages of using genetically superior animals in the production of animals and animal products.
ANS 05.03.01.c.	Select a breeding system based on the principles of genetics.
ANS 05.03.02.a.	Define natural and artificial breeding methods.
ANS 05.03.02.b.	Explain the processes of natural and artificial breeding methods.
ANS 05.03.02.c.	Select animal breeding methods based on reproductive and economic efficiency.
ANS 05.03.03.a.	Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.
ANS 05.03.03.b.	Compare and contrast quantitative breeding value differences between genetically superior animals and animals of average genetic value.
ANS 05.03.03.c.	Select animals based on quantitative breeding values for specific characteristics.
ANS 05.03.04.a.	Explain the advantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.
ANS 05.03.04.b.	Explain the processes of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.
ANS 05.03.04.c.	Perform procedures for estrous synchronization, superovulation, flushing, embryo transfer and other reproductive management practices.
ANS 05.03.05.a.	Discuss the uses and advantages and disadvantages of natural breeding and artificial insemination.
ANS 05.03.05.b.	Explain the materials, methods and processes of artificial insemination.
ANS 05.03.05.c.	Demonstrate artificial insemination techniques.

Industry-based knowledge and skill

Skill Type

ANS 06. Outline handling procedures for the safety of animals, producers and consumers of animal products.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: *Ag, Food and Natural Resource Systems*

 Cluster: *Agriculture*

 Focus Area: ***Animal Science Systems***

Performance Indicators

Delivery Level

ANS 06.01.	Demonstrate safe animal handling and management techniques.
ANS 06.01.01.a.	Discuss the dangers involved in working with animals.
ANS 06.01.01.b.	Outline safety procedures for working with animals by species.
ANS 06.01.01.c.	Interpret animal behaviors and execute protocols for safe handling of animals.
ANS 06.01.02.a.	Explain the implications of animal welfare and animal rights for animal agriculture.
ANS 06.01.02.b.	Design programs that assure the welfare of animals and prevent abuse or mistreatment.
ANS 06.01.02.c.	Implement quality-assurance programs and procedures for animal production.
ANS 06.02.	Implement procedures to ensure that animal products are safe.
ANS 06.02.01.a.	Identify animal production practices that could pose health risks or are considered to pose risks by some.
ANS 06.02.01.b.	Discuss consumer concerns with animal production practices relative to human health.
ANS 06.02.01.c.	Implement a program to assure the safety of animal products.
ANS 06.02.02.a.	Describe how animal identification systems can track an animal's location, nutrition requirements, production progress and changes in health.
ANS 06.02.02.b.	Explain why animal trace-back capability, using individual animal and farm identification systems, is important to producers and consumers.

Industry-based knowledge and skill

Skill Type

ANS 07. Select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.

Performance Indicators

Delivery Level

ANS 07.01.	Design animal housing, equipment and handling facilities for the major systems of animal production.
ANS 07.01.01.a.	Identify facilities needed to house and produce each animal species safely and efficiently.
ANS 07.01.01.b.	Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.
ANS 07.01.01.c.	Design an animal facility, focusing on animal requirements, efficiency, safety and ease of handling.
ANS 07.01.02.a.	Identify equipment and handling facilities used in modern animal production.
ANS 07.01.02.b.	Explain how modern equipment and handling facilities enhance the safe and economic production of animals.
ANS 07.01.02.c.	Select equipment and implement animal handling procedures and improvements to enhance production efficiency.
ANS 07.02.	Comply with government regulations and safety standards for facilities used in animal production.
ANS 07.02.01.a.	List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for animal production.
ANS 07.02.01.b.	Evaluate an animal facility to determine if standards have been met.
ANS 07.02.01.c.	Design a facility that meets standards for the legal, safe, ethical and efficient production of animals.

Industry-based knowledge and skill

Skill Type

ANS 08. Analyze environmental factors associated with animal production.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Animal Science Systems**

Performance Indicators

Delivery Level

ANS 08.01.	Analyze the effects of animal production on the environment.
ANS 08.01.01.a.	Evaluate the effects of animal agriculture on the environment.
ANS 08.01.01.b.	Outline methods of reducing the effects of animal agriculture on the environment.
ANS 08.01.01.c.	Implement measures to reduce the impact of animal agriculture on the environment.
ANS 08.02.	Evaluate the effects of environmental conditions on animals.
ANS 08.02.01.a.	Identify optimal environmental conditions for animals.
ANS 08.02.01.b.	Describe the effects of environmental conditions on animal populations and performance.
ANS 08.02.01.c.	Establish and maintain favorable environmental conditions for animal growth and performance.

Industry-based knowledge and skill

Skill Type

ANS 09. Identify contentious issues in animal science.

Performance Indicators

Delivery Level

ANS 09.01.	Examine the issues that are associated with animal systems within your given enterprise or geographic area (welfare, consumer concerns, feral populations, hormones/growth stimulant, interface of ag and society, government regulations, COOL (country of orig
ANS 09.01.01.a.	List issues and the competing viewpoints associated with animal science systems.
ANS 09.01.01.b.	Discuss and analyze the interrelationship of specific issues associated with animal science systems.
ANS 09.01.01.c.	Develop and resent a plan that enables all stakeholder to have input in resolving a given animal science issue within.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Plant Sciences and Horticulture**

Industry-based knowledge and skill

Skill Type

Plant 01. Apply knowledge of plant classification, plant anatomy and plant physiology to the production and management of plants.

Performance Indicators

Delivery Level

Plant 01.01.	Classify agricultural plants according to taxonomy systems.
Plant 01.01.01.a.	Explain systems used to classify plants.
Plant 01.01.01.b.	Compare and contrast the hierarchical classification of agricultural plants.
Plant 01.01.01.c.	Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.
Plant 01.01.02.a.	Describe the morphological characteristics used to identify agricultural plants.
Plant 01.01.02.b.	Identify agriculturally important plants by common names.
Plant 01.01.02.c.	Identify agriculturally important plants by scientific names.
Plant 01.02.	Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.
Plant 01.02.01.a.	Diagram a typical plant cell and identify plant cell organelles and their functions.
Plant 01.02.01.b.	Compare and contrast mitosis and meiosis.
Plant 01.02.01.c.	Apply the knowledge of cell differentiation and the functions of the major types of cells to plant systems.
Plant 01.02.02.a.	Identify the components, the types and the functions of plant roots.
Plant 01.02.02.b.	Identify root tissues and explain the pathway of water and nutrients into and through the root tissues.
Plant 01.02.02.c.	Relate the active and passive transport of minerals into and through the root system to plant nutrition.
Plant 01.02.03.a.	Identify the components and the functions of plant stems.
Plant 01.02.03.b.	Describe the processes of translocation.
Plant 01.02.03.c.	Apply concepts associated with translocation to the management of plants.
Plant 01.02.04.a.	Discuss leaf morphology and the functions of leaves.
Plant 01.02.04.b.	Explain how leaves capture light energy and allow for the exchange of gases.
Plant 01.02.04.c.	Explain the relationships between leaf structure and functions and plant management practices.
Plant 01.02.05.a.	Identify the components of a flower, the functions of a flower and the functions of flower components.
Plant 01.02.05.b.	Identify the different types of flowers and flower forms.
Plant 01.02.05.c.	Apply the knowledge of flower structures to plant breeding, production and use.
Plant 01.02.06.a.	Explain the functions and components of seeds and fruit.
Plant 01.02.06.b.	Identify the major types of fruit.
Plant 01.02.06.c.	Apply the knowledge of seed and fruit structures to plant culture and use.
Plant 01.03.	Apply knowledge of plant physiology and energy conversion to plant systems.
Plant 01.03.01.a.	Explain the basic process of photosynthesis and its importance to life on Earth.
Plant 01.03.01.b.	Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Plant Sciences and Horticulture**

Performance Indicators

Delivery Level

Plant 01.03.01.c.	Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management.
Plant 01.03.02.a.	Explain cellular respiration and its importance to plant life.
Plant 01.03.02.b.	Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration.
Plant 01.03.02.c.	Explain the four stages of aerobic respiration and relate cellular respiration to plant growth, crop management and post-harvest handling.
Plant 01.03.03.a.	Define primary growth and the role of the apical meristem.
Plant 01.03.03.b.	Explain the process of secondary plant growth.
Plant 01.03.03.c.	Relate the principles of primary and secondary growth to plant systems.
Plant 01.03.04.a.	Identify the five groups of naturally occurring plant hormones and synthetic plant growth regulators.
Plant 01.03.04.b.	Identify the plant responses to plant growth regulators and different forms of tropism.
Plant 01.03.04.c.	Select plant growth regulators to produce desired responses from plants.
Plant 01.03.05.a.	Identify the key natural cycles associated with plant growth and development (i.e. hydrologic cycle, nitrogen, oxygen, carbon).
Plant 01.03.05.b.	Analyze the natural cycles associated with plant growth and development (i.e. hydrologic cycle, nitrogen, oxygen, carbon).
Plant 01.03.05.c.	Evaluate a current plant management plan and determine if it is taking into account the natural cycles (i.e. hydrologic cycle, nitrogen, oxygen, carbon).

Industry-based knowledge and skill

Skill Type

Plant 02. Prepare a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.

Performance Indicators

Delivery Level

Plant 02.01.	Determine the influence of environmental factors on plant growth.
Plant 02.01.01.a.	Describe the qualities of light that affect plant growth.
Plant 02.01.01.b.	Describe plant responses to light color, intensity and duration.
Plant 02.01.01.c.	Evaluate plant responses to varied light color, intensity and duration.
Plant 02.01.02.a.	Describe the effects air, temperature and water have on plant metabolism and growth.
Plant 02.01.02.b.	Determine the optimal air, temperature and water conditions for plant growth.
Plant 02.01.02.c.	Design, implement and evaluate a plan to maintain optimal conditions for plant growth.
Plant 02.02.	Prepare growing media for use in plant systems.
Plant 02.02.01.a.	Identify the major components of growing media and describe how growing media support plant growth.
Plant 02.02.01.b.	Describe the physical characteristics of growing media and explain the influence they have on plant growth.
Plant 02.02.01.c.	Formulate and prepare growing media for specific plants or crops.
Plant 02.02.02.a.	Identify the categories of soil water.
Plant 02.02.02.b.	Discuss how soil drainage and water-holding capacity can be improved.
Plant 02.02.02.c.	Determine the hydraulic conductivity for soil and how the results influence irrigation practices.
Plant 02.03.	Develop a fertilization plan for specific plants or crops.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: *Ag, Food and Natural Resource Systems*

 Cluster: *Agriculture*

 Focus Area: ***Plant Sciences and Horticulture***

Performance Indicators

Delivery Level

Plant 02.03.01.a.	Identify the essential nutrients for plant growth and development and their major functions.
Plant 02.03.01.b.	Describe nutrient deficiency symptoms and recognize environmental causes of nutrient deficiencies.
Plant 02.03.01.c.	Monitor plants for signs of nutrient deficiencies and prepare a scouting report.
Plant 02.03.02.a.	Discuss the influence of pH and cation exchange capacity on the availability of nutrients.
Plant 02.03.02.b.	Contrast pH and cation exchange capacity between mineral soil and soilless growing media.
Plant 02.03.02.c.	Adjust the pH of growing media.
Plant 02.03.03.a.	Collect soil and plant tissue samples for testing and interpret the test results.
Plant 02.03.03.b.	Determine the nutrient content of soil using appropriate laboratory procedures and prescribe fertilization based on results.
Plant 02.03.04.a.	Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations and describe different methods of fertilizer application.
Plant 02.03.04.b.	Calculate the amount of fertilizer to be applied and calibrate equipment to apply the prescribed amount of fertilizer.
Plant 02.03.04.c.	Use variable-rate technology to apply fertilizers to meet crop nutrient needs.
Plant 02.04.	Develop a Pest Management Plan for specific plants or crops.
Plant 02.04.01.a.	To be defined
Plant 02.04.01.b.	To be defined
Plant 02.04.01.c.	To be defined
Plant 02.05.	Develop a irrigation plan / water management for specific plants or crop system.
Plant 02.05.01.a.	To be defined
Plant 02.05.01.b.	To be defined
Plant 02.05.01.c.	To be defined
Plant 02.06.	Develop a plan for sustainable agriculture systems using principals and practices of plant production.
Plant 02.06.01.a.	To be defined
Plant 02.06.01.b.	To be defined
Plant 02.06.01.c.	To be defined

Industry-based knowledge and skill

Skill Type

Plant 03. Propagate, culture and harvest plants.

Performance Indicators

Delivery Level

Plant 03.01.	Demonstrate plant propagation techniques.
Plant 03.01.01.a.	Explain pollination, cross-pollination and self-pollination of flowering plan
Plant 03.01.01.b.	Diagram the process of plant fertilization.
Plant 03.01.01.c.	Design and implement a plan to control the pollination of plants.
Plant 03.01.02.a.	Demonstrate sowing techniques and provide favorable conditions for seed germination.
Plant 03.01.02.b.	Handle seed to overcome seed dormancy mechanisms and to maintain seed viability and vigor.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Agriculture**

 Focus Area: **Plant Sciences and Horticulture**

Performance Indicators

Delivery Level

Plant 03.01.02.c.	Conduct tests associated with seed germination rates, viability and vigor.
Plant 03.01.03.a.	Describe optimal conditions for asexual propagation and demonstrate techniques used to propagate plants b
Plant 03.01.03.b.	Demonstrate proper procedures in budding or grafting selected materials.
Plant 03.01.03.c.	Evaluate asexual propagation practices based on productivity and efficiency.
Plant 03.01.04.a.	Define micropropagation, discuss advantages associated with the practice and outline the four main stages of the process.
Plant 03.01.04.b.	Demonstrate aseptic micropropagation techniques.
Plant 03.01.04.c.	Propagate plants by micropropagation.
Plant 03.01.05.a.	Explain the principles behind recombinant DNA technology and the basic steps in the process.
Plant 03.01.05.b.	Give examples of the risks and advantages associated with genetically modified plants.
Plant 03.01.05.c.	Evaluate the performance of genetically modified crops.
Plant 03.01.06.c.	Demonstrate the use and applications of micro propagation.
Plant 03.02.	Demonstrate and implement a plant management plan for crop production.
Plant 03.02.01.a.	Explain the importance of starting with pest-and disease-free propagation material.
Plant 03.02.01.b.	Inspect propagation material for evidence of pests or disease.
Plant 03.02.01.c.	Produce pest-and disease-free propagation material.
Plant 03.02.02.a.	Explain the reasons for preparing growing media before planting.
Plant 03.02.02.b.	Prepare soil for planting with the addition of amendments.
Plant 03.02.02.c.	Prepare growing media for planting.
Plant 03.02.03.a.	Demonstrate proper planting procedures and post-planting care.
Plant 03.02.03.b.	Apply pre-plant treatments required of seeds and plants and evaluate the results.
Plant 03.02.03.c.	Operate mechanized planting equipment.
Plant 03.02.04.a.	Observe and record environmental conditions during the germination, growth and development of a crop.
Plant 03.02.04.b.	Monitor the progress of plantings and determine the need to adjust environmental conditions.
Plant 03.02.04.c.	Prepare and implement a plant production schedule based on predicted environmental conditions.
Plant 03.02.05.a.	Explain the reasons for controlling plant growth.
Plant 03.02.05.b.	Demonstrate proper techniques to control and manage plant growth through mechanical, cultural or chemical means.
Plant 03.02.05.c.	Create and implement a plan to control and manage plant growth.
Plant 03.03.	Demonstrate and implement a plan for integrated pest management.
Plant 03.03.01.a.	Identify types of plant pests and disorders.
Plant 03.03.01.b.	Identify major local weeds, insect pests and infectious and noninfectious plant diseases.
Plant 03.03.01.c.	Design and implement a crop scouting program.
Plant 03.03.02.a.	Describe damage caused by plant pests and diseases.
Plant 03.03.02.b.	Diagram the life cycles of major plant pests and diseases.
Plant 03.03.02.c.	Predict pest and disease problems based on environmental conditions and life cycles.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Plant Sciences and Horticulture**

Performance Indicators

Delivery Level

Plant 03.03.03.a.	Describe pest control strategies associated with integrated pest management.
Plant 03.03.03.b.	Describe types of pesticide controls and formulations.
Plant 03.03.03.c.	Employ pest management strategies to manage pest populations, assess the effectiveness of the plan and adjust the plan as needed.
Plant 03.03.04.a.	Explain risks and benefits associated with the materials and methods used in plant pest management.
Plant 03.03.04.b.	Explain procedures for the safe handling, use and storage of pesticides.
Plant 03.03.04.c.	Evaluate environmental and consumer concerns regarding pest management strategies.
Plant 03.04.	Apply principles and practices of sustainable agriculture to plant production.
Plant 03.04.01.a.	Explain sustainable agriculture and objectives associated with the strategy.
Plant 03.04.01.b.	Describe sustainable agriculture practices and compare the ecological effects of traditional agricultural practices with those of sustainable agriculture.
Plant 03.04.01.c.	Prepare and implement a plan for an agricultural enterprise that involves practices in support of sustain
Plant 03.05.	Harvest, handle and store crops.
Plant 03.05.01.a.	Identify harvesting methods and harvesting equipment.
Plant 03.05.01.b.	Assess the stage of growth to determine crop maturity or salability and demonstrate proper harvesting techniques.
Plant 03.05.01.c.	Operate mechanized harvesting equipment.
Plant 03.05.02.a.	Explain reasons for calculating crop yield and loss.
Plant 03.05.02.b.	Evaluate crop yield and loss data.
Plant 03.05.02.c.	Implement plans to reduce crop loss.
Plant 03.05.03.a.	Identify storage methods for plants and plant products.
Plant 03.05.03.b.	Explain the proper conditions to maintain the quality of plants and plant products held in storage.
Plant 03.05.03.c.	Monitor environmental conditions in storage facilities for plants and plant products.
Plant 03.05.04.a.	Explain the reasons for preparing plants and plant products for distribution.
Plant 03.05.04.b.	Demonstrate techniques for grading, handling and packaging plants and plant products for distribution.
Plant 03.05.04.c.	Evaluate techniques for grading, handling and packaging plants and plant products.

Industry-based knowledge and skill

Skill Type

Plant 04. Employ elements of design to enhance an environment.

Performance Indicators

Delivery Level

Plant 04.01.	Create designs using plants for ornamental and production systems.
Plant 04.01.01.a.	Define design and identify design elements.
Plant 04.01.01.b.	Explain design elements of line, form, texture and color and express the visual effect each has on the viewer.
Plant 04.01.01.c.	Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.
Plant 04.01.02.a.	Discuss the applications of art in agriculture/horticulture.
Plant 04.01.02.b.	Discuss principles of design that form the basis of artistic impression.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Agriculture

 Focus Area: **Plant Sciences and Horticulture**

Performance Indicators

Delivery Level

Plant 04.01.02.c.	Create and implement designs by following established principles of art.
Plant 04.02.	Recognize plants that encourage conservation practices (set asides, conservation buffers, riparian zones, wildlife habitat)
Plant 04.02.01.a.	Identify and describe the benefits that agriculture crops provide for wildlife.
Plant 04.02.01.b.	To be defined
Plant 04.02.01.c.	To be defined

Industry-based knowledge and skill

Skill Type

Plant 05. Apply federal, state and local laws / regulations that relate to specific plant production enterprises.

Performance Indicators

Delivery Level

Plant 05.01.	Recognize plants that encourage conservation practices (set asides, conservation buffers, riparian zones, wildlife habitat)
Plant 05.01.01.a.	To be defined
Plant 05.01.01.b.	To be defined
Plant 05.01.01.c.	To be defined
Plant 05.02.	Recognize plants that encourage conservation practices (set asides, conservation buffers, riparian zones, wildlife habitat)
Plant 05.02.01.a.	To be defined
Plant 05.02.01.b.	To be defined
Plant 05.02.01.c.	To be defined

Industry-based knowledge and skill

Skill Type

Plant 06. Horticulture standards and skills specific to Oregon's horticulture industry. Key words (hort, nursery, landscape, ornamental, turfgrass, turf, garden, botanical, greenhouse, green industry, Xeriscape)

Performance Indicators

Delivery Level

Plant 06.01.	To be defined 2009-2010
Plant 06.01.01	To be defined 2009-2010
Plant 06.01.02	To be defined 2009-2010

Industry-based knowledge and skill

Skill Type

Plant 07. Floriculture standards and skills specific to the floriculture industry. Key words (floral, floriculture, interiorscape, greenhouse, design,)

Performance Indicators

Delivery Level

Plant 07.01.	To be defined 2009-2010
Plant 07.01.01	To be defined 2009-2010
Plant 07.01.02	To be defined 2009-2010