**Course Description:**

Students will learn causes, symptoms, and treatment of common diseases with special emphasis on developing preventative health management plans and breeding programs. Topics include veterinary pharmacology, radiology and imaging techniques, principles of surgery, safe laboratory skills, and the concepts of ethics and professionalism in the work place. Students will develop skills in inquiry and statistical methods. Throughout the course, learners will utilize principles of technology to manage information systems, and research issues affecting the industry.

**Strand 1. Business Operations/21st Century Skills**

Learners apply principles of economics, business management, marketing and employability in an entrepreneur, manager and employee role to the leadership, planning, developing and analyzing of business enterprises related to the career field.

**Outcome: 1.1. Employability Skills**

Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

**Competencies**

1.1.1. Identify the knowledge, skills and abilities necessary to succeed in careers.

1.1.2. Identify the scope of career opportunities and the requirements for education, training, certification, licensure and experience.

**Outcome: 1.2. Leadership and Communications**

Process, maintain, evaluate and disseminate information in a business. Develop leadership and team building to promote collaboration.

**Competencies**

1.2.1. Extract relevant, valid information from materials and cite sources of information.

1.2.2. Deliver formal and informal presentations.

1.2.4. Use negotiation and conflict-resolution skills to reach solutions.

1.2.5. Communicate information (e.g., directions, ideas, vision, workplace expectations) for an intended audience and purpose.

1.2.6. Use proper grammar and expression in all aspects of communication.

1.2.7. Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.

1.2.10. Use interpersonal skills to provide group leadership, promote collaboration and work in a team.

1.2.11. Write professional correspondence, documents, job applications and resumés.

1.2.12. Use technical writing skills to complete forms and create reports.

**Outcome: 1.3. Business Ethics and Law**

Analyze how professional, ethical and legal behavior contributes to continuous improvement in organizational performance and regulatory compliance.

**Competencies**

1.3.1. Analyze how regulatory compliance (e.g., United States Department of Agriculture [USDA], Food and Drug Administration [FDA], United States Department of Interior [USDI], Ohio Livestock Care Standards, water quality standards, local water regulations, building codes) affects business operations and organizational performance.

1.3.2. Follow protocols and practices necessary to maintain a clean, safe and healthy work environment.

1.3.3. Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice).

1.3.5. Access and implement safety compliance measures (e.g., quality assurance information, safety data sheets [SDSs], product safety data sheets [PSDSs], United States Environmental Protection Agency [EPA], United States Occupational Safety and Health Administration [OSHA]) that contribute to the continuous improvement of the organization.

**Outcome: 1.4. Knowledge Management and Information Technology**

Demonstrate current and emerging strategies and technologies used to collect, analyze, record and share information in business operations.

**Competencies**

1.4.1. Use office equipment to communicate (e.g., phone, radio equipment, fax machine, scanner, public address systems).

1.4.7. Use personal information management and productivity applications to optimize assigned tasks (e.g., lists, calendars, address books).

**Outcome: 1.5. Global Environment**

Evaluate how beliefs, values, attitudes and behaviors influence organizational strategies and goals.

**Competencies**

1.5.2. Describe how cultural intelligence skills influence the overall success and survival of an organization.

1.5.4. Recognize barriers in cross-cultural relationships and implement behavioral adjustments.

**Outcome: 1.6. Business Literacy**

Develop foundational skills and knowledge in entrepreneurship, financial literacy and business operations.

**Competencies**

1.6.1. Identify business opportunities.

1.6.2. Assess the reality of becoming an entrepreneur, including advantages and disadvantages (e.g., risk versus reward, reasons for success and failure).

1.6.3. Explain the importance of planning your business.

**Outcome: 1.8. Operations Management**

Plan, organize and monitor an organization or department to maximize contribution to organizational goals and objectives.

**Competencies**

1.8.5. Use inventory and control systems to purchase materials, supplies and equipment (e.g., Last In, First Out [LIFO]; First In, First Out [FIFO]; Just in Time [JIT]; LEAN).

1.8.8. Identify routine activities for maintaining business facilities and equipment.

1.8.9. Develop a budget that reflects the strategies and goals of the organization.

**Outcome: 1.10. Sales and Marketing**

Manage pricing, place, promotion, packaging, positioning and public relations to improve quality customer service.

**Competencies**

1.10.2. Determine the customer's needs and identify solutions.

1.10.3. Communicate features, benefits and warranties of a product or service to the customer.

**Outcome: 1.12. Site and Personal Safety Procedures**

Follow site and personal safety procedures in specific situations with specialized tools and equipment, evaluate the situation and take corrective action.

**Competencies**

1.12.1. Use Occupational Safety and Health Administration (OSHA) defined procedures for identifying

employer and employee responsibilities, working in confined spaces, managing worker safety

programs, using ground fault circuit interrupters (GFCIs), maintaining clearance and boundaries and labeling.

1.12.7. Select, use, store, maintain and dispose of personal protective equipment (PPE), appropriate to job tasks, conditions and materials.

1.12.8. Identify safety hazards and take corrective measures.

1.12.9. Identify, inspect and use safety equipment appropriate for the task.

*An “X” indicates that the pathway applies to the outcome.*

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| **Pathways** |  | Agribusiness and Production Systems | X | Animal Science and Management |  | Bioscience | | |  | Horticulture |
|  | Natural Resource Management |  | Power Technology | | |  |  | | |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Strand 2. Animal Science**

Learners apply principles of animal anatomy, physiology, genetics, behavior and nutrition to the research and development, selection and reproduction, health and management of animals in domestic and natural environments.

**Outcome: 2.2. Body Systems**

Describe the interrelationships of animal body systems with growth, development, health, maintenance, reproduction and economic production.

**Competencies**

2.2.1. Describe external anatomical parts and their functions.

2.2.2. Identify the anatomical parts of the digestive system and describe their physiology.

2.2.3. Identify anatomical components of nerve tissue and the nervous system, including regions of the brain, spinal nerves and the sympathetic and parasympathetic system, and describe their physiology.

2.2.4. Identify the anatomical components of the skeletal system, including the types and forms of bones, and describe their physiology.

2.2.5. Identify the anatomy of the musculature systems, including striated, cardiac and smooth muscle, and describe their physiology.

2.2.6. Compare and contrast bone growth, muscle growth, and fat deposition in relation to developmental patterns.

2.2.7. Describe the physical characteristics, components and functions of blood.

2.2.8. Describe the components of the cardiovascular system and their functions, including factors affecting blood flow.

2.2.9. Describe the integumentary system (e.g., skin, hair, nails, wool, feathers), related structures and functions.

2.2.10. Describe the function and components of the respiratory system and pulmonary ventilation and the factors influencing respiratory rates.

2.2.11. Describe the urinary system structures and functions, including excretion and osmoregulation.

2.2.12. Differentiate between the male and female reproductive system, structures and functions.

2.2.13. Describe the endocrine system, its structures and the role of hormones.

2.2.14. Describe the immune system and the lymphatic system’s role in immunity.

2.2.15. Identify the anatomy and describe the physiology of the mammary system.

**Outcome: 2.3. Care and Management**

Apply animal care and management procedures to ensure animal husbandry and welfare, including managing environmental conditions to ensure animal health and performance.

**Competencies**

2.3.11. Recognize common restraints and tack devices, including their use and adjustment.

**Outcome: 2.4. Recognizing Diseases and Disorders**

Evaluate animal conditions for species-specific diseases and disorders to assess an animal’s health and welfare.

**Competencies**

2.4.1. Identify general infectious and noninfectious causes of diseases and disorders.

2.4.2. Examine an animal to evaluate its general condition.

2.4.3. Investigate and appraise signs of pain, distress, allergic reactions and lameness.

2.4.4. Assess genetic abnormalities in the skeleton, body form and body functions and identify the

symptoms associated.

2.4.5. Explain the symptoms that are associated with an abnormality caused by environmental factors.

2.4.6. Assess symptoms of animals to identify diseases caused by a microorganism (e.g., parasite, virus, bacteria, fungi, protozoa).

2.4.7. Identify and describe zoonotic diseases.

2.4.8. Explain the health risk of zoonotic diseases on humans and their historical significance and future implications.

2.4.9. Implement disease prevention methods and procedures.

2.4.10. Collect and prepare voided specimens and perform urinalysis and fecal floatation with centrifugation.

2.4.11. Produce diagnostic radiographs using x-ray equipment and image receptors.

2.4.12. Apply principles of image physics and perform ultrasound techniques.

2.4.13. Determine types of immunity and immune responses and simulate the administration of species-specific immunizations to maintain overall health.

2.4.14. Identify and recognize normal and abnormal dental structures and conditions.

**Outcome: 2.5. Animal Health**

Implement preventive measures, treatment and maintenance options for species-specific diseases and disorders to improve an animal’s health and welfare.

**Competencies**

2.5.1. Obtain and interpret an animal's vitals.

2.5.3. Recognize the preventative measures or treatments needed to maintain animal health.

2.5.4. Apply basic principles of first-aid.

2.5.5. Inventory, store and dispose of pharmaceutical drugs by category, class and label.

2.5.6. Describe the routes of administration for medications and the process of drug absorption, distribution, metabolism, withdrawal and excretion.

2.5.7. Interpret and follow label directions for the dosage, route of administration and withdrawal period.

2.5.8. Simulate the administration of drug treatments and vaccines, following quality assurance guidelines, and monitor common adverse effects and potential problems associated with administration.

2.5.9. Prepare a sterile surgical environment, prepare patients for surgery and conduct post-operative procedures.

2.5.10. Describe advantages, disadvantages and adverse side effects of commonly used pre-anesthetic and anesthetic agents.

**Outcome: 2.6. Population Management**

Manage reproduction practices in animal populations across habitats to achieve the desired outcomes and specific goals.

**Competencies**

2.6.6. Evaluate and employ breeding methods (e.g., artificial insemination, embryo transfer, natural

selection, selective breeding, invitro fertilization, cloning).

2.6.8. Describe ethical and responsible animal population management practices (e.g., spaying, neutering, birth control, relocation, reintroduction, hunting, containment, culling).

**Outcome: 2.7. Animal Behavior**

Apply management practices to assure quality animal care, considering species-specific behaviors, human safety, social influences, public perception and regulations associated with animal welfare.

**Competencies**

2.7.1. Understand social influences, public perception and regulations that are associated with animal welfare.

2.7.5. Interpret an animal’s intent based on its vocalization, body posture and chemical means of

communication.

2.7.6. Recognize behavior abnormalities and employ corrective action.

2.7.7. Handle, restrain and move animals, while ensuring the safety of the animals and their handlers.

*An “X” indicates that the pathway applies to the outcome.*

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| **Pathways** |  | Agribusiness and Production Systems | X | Animal Science and Management |  | Bioscience | | |  | Horticulture |
|  | Natural Resource Management |  | Power Technology | | |  |  | | |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Strand 3. Biotechnology**

Learners apply the skills and knowledge of interpreting laboratory requests, using protective clothing and hazardous material containment, specimen collection procedures, a variety of laboratory testing and techniques, and maintenance of laboratory equipment and supplies.

**Outcome: 3.8. Research and Experiments**

Conduct a problem-based study, applying scientific methodology and using descriptive statistics to communicate and support predictions and conclusions.

**Competencies**

3.8.1. Identify research problems and structure a statistical experiment, simulation or study related to the problem.

3.8.2. Design a research plan, including the significance of the problem, purpose, variables, hypotheses, objectives, methods of study and a list of materials.

3.8.4. Establish and implement procedures for systematic collection, organization and use of data.

3.8.5. Select and apply sampling methods that appropriately represent the population to be studied.

3.8.7. Document results of the experiment in a laboratory notebook, including a statement of purpose, experimental designs, observations, results, conclusions and next steps.

3.8.8. Compute measures of central tendency and dispersion to interpret results and draw conclusions.

3.8.9. Describe the relationships among variables using correlations and draw conclusions.

3.8.10. Create, interpret and use tabular and graphical displays and describe the data.

3.8.11. Draw conclusions based on observations and data analyses, recognizing that experimental results must be open to the scrutiny of others.

3.8.12. Prepare and present findings using scientific reports.

*An “X” indicates that the pathway applies to the outcome.*

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| **Pathways** |  | Agribusiness and Production Systems | X | Animal Science and Management |  | Bioscience | | |  | Horticulture |
|  | Natural Resource Management |  | Power Technology | | |  |  | | |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |