# Agricultural and Environmental Systems Career Field

## Animal Anatomy and Physiology

**Subject Code: 010945**

**Outcome & Competency Descriptions**

**Course Description:**

Students will examine the structure and function of the major organ systems as well as the function and principle of blood flow in animals. Students will study internal and external anatomical parts, their functions, and will investigate the relationship among these parts and systems within the body of an animal. Throughout the course, students will apply the internal functions of anatomical structures to the business and industry principles of the animal 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.

**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.

1.12.5. Identify the location of emergency flush showers, eyewash fountains, Safety Data Sheets (SDSs), fire alarms and exits.

1.12.6. Identify procedures for the handling, storage and disposal of hazardous materials.

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.

1.12.10. Follow established procedures for the administration of first aid and contact emergency medical personnel when necessary.

**Strand 2. Animal Science**

Learners apply principles of animal anatomy, physiology, genetics, behavior, nutrition and production 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 within different species.

2.2.2. Compare and contrast the anatomical parts of the digestive system(s) and describe their physiology within different species.

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

2.2.8. Identify and describe the physical characteristics, components and functions of blood.

2.2.9. Identify and describe the integumentary system (e.g. skin, hair, nails, wool, feathers, scales), related structures, functions and cycles.

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

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

2.2.12. Compare and contrast 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. Identify and describe the immune system and the lymphatic system’s role in immunity.

**Outcome: 2.3 Care and Management**

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

**Competencies**

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

**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**

2.4.2. Identify abnormalities in the skeleton, body form, and functions and identify associated symptoms.

**Outcome: 2.6. Population Management**

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

**Competencies**

2.6.1. Identify factors that lead to reproductive maturity and select animals for reproductive readiness.

2.6.3. Compare and select superior individuals based on breeding values and heritability of the desired traits.

2.6.4 Identify normal and abnormal signs of parturition and recommend appropriate management practices.

**Strand 5. Elements of Production**

Learners apply principles of practice related to the management and maintenance of food, agriculture and natural resources systems.

**Outcome: 5.15. Animal Behavior**

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

**Competencies**

5.15.2. Describe the adaptations and special senses (e.g., sight, hearing, smell, touch) of animals and how they contribute to animal behavior.