CHINO VALLEY UNIFIED SCHOOL DISTRICT
INSTRUCTIONAL GUIDE
VETERINARY SCIENCE ANATOMY AND PHYSIOLOGY

Course Number	5407
Department	Agriculture
Length of Course	Two (2) Semesters/One (1) year
Grade Level	10-12
Prerequisites	Successful completion of Agriculture Biology or Biology CP and successful completion of Algebra 1 and/or teacher recommendation
Credit	5 units per semester/10 total credits – biological science
Repeatable	Not repeatable for credit
UC/CSU	Meets the "d" laboratory science requirement
Board Approved	March 1, 2012

Description of Course – Veterinary Science is an academically challenging laboratory science course that examines anatomy, physiology, biochemistry, and medical terminology while applying scientific knowledge and research to the study of various agriculture and pet animals. Students will focus on the physiological, biological, and structural details of the body, including a rigorous study of the body systems. Students will apply scientific methodologies (inquiry, developing hypotheses, gathering factual information, evaluating data, and drawing conclusions) to the practices employed by veterinary medicine professionals. Medical terminology and animal disease and diagnosis will be integrated as students understand each of the multiple body systems. Students will exceed core academic knowledge and demonstrate critical thinking skills as they apply knowledge to laboratory experimentation, real-life scenarios, medical case studies, and physiological response and treatment of infection. Students will perform advanced research of various physiological and pathological disorders. A variety of resources will be accessed (Internet, veterinary journals and books, and veterinary professionals) for the purpose of creating written and oral presentations that demonstrate students' knowledge and application of scientific principles. Students will participate in leadership activities through the Future Farmers of America (FFA) and will be involved in an agriculture project as a "hands-on" application of classroom knowledge.

Rationale for Course – This course offers advanced biology content in an agricultural setting, allowing the school agriculture laboratory to become an integral part of the science program. This course is intended to build upon the knowledge learned in biology to increase student knowledge of the anatomy and physiology of agricultural and pet animals. This course provides students with alternate opportunities to meet the laboratory science requirement. This course is aligned to the California state standards in Biology and the California standards for Agriculture Education.

Introduction to Veterinary Science

Standard 1 – Students understand that veterinary medicine is a scientific study that has developed and improved over time.

1.1 Objective: Understand the impact of experimentation by using the scientific method development of medical science.

1.1.1 Performance Indicator: Students will develop research skills as they research the historical development of the modern practice of veterinary medicine (diagnostic and treatment) and procedures used within that specific medical practice.

1.1.2 Performance Indicator: Students will understand the cumulative nature of scientific discovery and how it applies to practice in veterinary medicine.

1.1.3 Performance Indicator: Students will be able to select and use appropriate tools and technology (such as computer linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.

1.1.4 Performance Indicator: Students will be able to formulate explanations by using logic and evidence.

1.1.5 Performance Indicator: Students will be able to distinguish between hypothesis and theory as scientific terms.

1.1.6 Performance Indicator: Students will be able to recognize the usefulness and limitations of models and theories as scientific representations of reality.

1.1.7 Performance Indicator: Students will be able to recognize the cumulative nature of scientific evidence.

1.1.8 Performance Indicator: Students will be able to analyze situations and solve problems that require combining and applying concepts from more than one area of science.

1.1.9 Performance Indicator: Students will be able to investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings.

1.2 Objective: Understand the importance of proper experimental procedures.

1.2.1 Performance Indicator: Students will know the safe and proper handling of lab equipment and microscopes.

1.2.2 Performance Indicator: Students will be able to select the proper equipment needed to gather and analyze data.

1.2.3 Performance Indicator: Students will be able to form a hypothesis and design an experiment to test their hypothesis.

1.2.4 Performance Indicator: Students will be able to identify and communicate sources of unavoidable experimental error.

1.2.5 Performance Indicator: Students will be able to identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.

1.2.6 Performance Indicator: Students will be able to recognize the issues of statistical variability and the need for controlled tests.

1.2.7 Performance Indicator: Students will be able to determine when an observation does not agree with an accepted scientific theory, if the observation is mistaken or fraudulent and if the theory is sometimes wrong.

1.3 Objective: Recognize, define, and use basic biological, anatomical and physiological medical terminology and apply it to the practice of research.

1.3.1 Performance Indicator: Students will increase scientific literacy skills and develop a working vocabulary in medical terminology (the base of root words usually Latin), prefixes, suffixes, and whole terms in defining terms, understanding terms and applying terms to the discussion of physiology and anatomy of the animal body.

1.3.2 Performance Indicator: Students will be exposed to medical terminology specific to veterinary science, will demonstrate mastery of medical terminology through standards tests, quizzes, laboratory reports, research papers, and oral board presentations designed to critic and evaluate mastery of skill through lecture, demonstration practice in scientific research, computer activities, and laboratory assignment

1.3.3 Performance Indicator: Students will develop literacy skills in the content area and increase proficiency in reading and understanding college-level expository science text through reading higher-level scientific reference texts, research reports, journals and supplemental materials

1.3.4 Performance Indicator: Students will understand terminology, identify, and anatomically map the body planes for various livestock and pet animals.

1.3.5 Performance Indicator: Students will be able to identify the location of body cavities and membranes.

1.3.6 Performance Indicator: Students will be able to use prefixes and suffixes relevant to medical terminology.

1.4 Objective: Understand the basic interactions of chemical compounds relating to the structure and function in the body.

1.4.1 Performance Indicator: Students will know the individual functions and sites of secretion of digestive enzymes; i.e. amylases, proteases, nucleases, lipases, stomach acid, and bile salts.

1.4.2 Performance Indicator: Students will know enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the temperature, ionic conditions, and the pH of the surroundings.

1.4.2.1 Laboratory Activity: Enzyme breakdown of liver, pudding.

1.4.2.2 Laboratory Activity: Analyzing cattle bolus under a microscope.

Microbiology, Cells, Disease, and Epidemiology

Standard 2 – Students gain knowledge of and build on the understanding of the cell as the basic building block of life and describe structural physiological differentiation in the eukaryotic cell.

2.1 Objective: Correctly identify cells and their related histological groups; label the major distinguishing anatomical features and explain the function of each of those features within the various tissues, organs, and organ systems.

2.1.1 Performance Indicator: Students will recognize basic differences in normal and abnormal cellular structure.

2.1.2 Performance Indicator: Students will be able to identify epithelial, connective, muscle and nervous tissue and explain the special characteristics of each.

2.1.3 Performance Indicator: Students will be able to classify all epithelial, connective and muscle tissue types and identify their location and functions.

2.1.3.1 Laboratory Activity: Given a group of prepared histological slides, pictures, or drawings, students will be able to name the specific tissue and assign each to their respective major tissue group and associated organ system.

2.2 Objective: Discover and practice the techniques of tissue sample preparation and examination common to veterinary pathology practices.

2.2.1 Performance Indicator: Students will engage in investigative case studies examining tissue samples and utilizing their knowledge of cell function will determine if there is evidence of disorder, and to a limited degree determine the general cause of that disorder.

2.2.1.1 Laboratory Activity: Students will distinguish between healthy and unhealthy tissues using mounted preserved slide samples of each for their evaluation and written analysis.

2.2.1.2 Laboratory Activity: Students will prepare tissue samples using a microtome and demonstrate how to conduct proper mount techniques in use of pathological examinations of tissues.

2.3 Objective: Gain knowledge on representative strains of bacteria commonly dealt with in large and small animal environments.

2.3.1 Performance Indicator: Students will demonstrate understanding of the environments conducive to bacterial reproduction.

2.3.2 Performance Indicator: Students will explore the historical development of the gram stain, how the stain reacts to the organism, and the significance of the stain to microbiology.

2.3.2.1 Laboratory Activity: Students will demonstrate their ability to correctly fix and stain samples of bacteria using gram stain and then, using the results, identify bacteria samples as gram positive or negative.

Control of Disease

Standard 3 – Students apply their knowledge of microorganisms and the role microorganisms play in the spread of disease while understanding the principles of disease transition and the methods of infection control in medical and farm facility environments.

3.1 Objective: Understand the asepsis principles and will apply those principles to a variety of situations.

3.1.1 Performance Indicator: Students will explain the procedures outlined in Koch's Postulates as proof of the germ theory of disease and what appropriate technique is used for isolating bacteria in pure culture environment.

3.1.2 Performance Indicator: Students will successfully perform a transfer of and isolate bacteria in pure cultures, thus demonstrating sterile technique process.

3.1.3 Performance Indicator: Students will be able to describe and demonstrate standard precautions for control of infections both inside a veterinary facility and in the field.

3.1.4 Performance Indicator: Students will understand and apply through demonstration sterilization procedures for equipment surfaces and wounds.

3.2 Objective: Understand how disease is recognized, how it can be prevented, how it is spread, and how to treat it.

3.2.1 Performance Indicator: Students will know the various types of disease causing agents, their etiology, clinical signs, prevention, and treatment.

3.2.2 Performance Indicator: Students will be able to identify the causes and control of common animal diseases.

Digestive and Excretory System

Standard 4 – Students be aware of the different components of the various animal digestive systems, their function, and role. Students understand the role of the kidneys in blood filtration and waste removal.

4.1 Objective: Distinguish between the various animal digestive systems.

4.1.1 Performance Indicator: Students will be able to list the parts of the monogastric, ruminant, functioning cecum, and avian digestive systems.

4.1.1.1 Lab Activity: Dissection of a ruminant and monogastric stomach.

4.1.2 Performance Indicator: Students will be able to identify common species with monogastric, ruminant, functioning cecum, and avian digestive systems.

4.1.3 Performance Indicator: Students will be able to identify the dietary differences of species with monogastric, ruminant, functioning cecum, and avian digestive systems.

4.2 Objective: Identify the functions and diseases of the digestive systems.

4.2.1 Performance Indicator: Students will be able to identify five functions of the digestive system.

4.2.2 Performance Indicator: Students will know the medical terminology related to the digestive track.

4.2.3 Performance Indicator: Students will be able to recognize common diseases and disorders of the digestive system.

4.3 Objective: Demonstrate knowledge of the anatomy and physiology of the kidney as it relates to blood filtration and excretion of waste.

4.3.1 Performance Indicator: Students will know the homeostatic role of the kidneys in the removal of nitrogenous wastes and the role of the liver in blood detoxification and glucose balance.

4.3.2 Performance Indicator: Students will know how urine is produced and what comprises normal urine.

4.3.3 Performance Indicator: Students will be able to recognize common diseases and disorders of the renal system.

4.3.4 Performance Indicator: Students will examine the regulation of urine concentration and body fluids as it relates to animal health.

4.3.5 Performance Indicator: Students will be able to read the results of a urinalysis and diagnose potential causes of disease using the given information.

4.3.5.1 Laboratory Activity: Urinalysis; including specific gravity, chemical composition, color and odor.

Nutrition

Standard 5 – Students understand the role of animal nutrition in maintaining animal health.

5.1 Objective: Understand how nutrition can affect disease in a healthy or non-healthy animal.

5.1.1 Performance Indicator: Students will know the nutritional requirements of animals, their effect on or cause of disease, and its treatment and prevention.

5.1.2 Performance Indicator: Students will be able to list and define the six required nutrients and to identify animal feeds that are a good source of each nutrient.

5.1.3 Performance Indicator: Students will know the relationship of nutrition, ingestion, enzymes, digestive processes, and intestinal discharges.

5.1.3.1 Laboratory Activity: Evaluation of components within a cattle bolus.

5.1.4 Performance Indicator: Students will understand how animal nutrition is affected by the digestive, endocrine, and circulatory systems.

5.2 Objective: Understand the principles for providing proper balanced rations for a variety of production stages in ruminants and monogastrics.

5.2.1 Performance Indicator: Students will be able to develop and test a balanced diet for a given animal at a given production stage.

5.2.2 Performance Indicator: Students will be able to examine, analyze and evaluate an animal feed sample for the eight characteristics of a feed stuff.

5.2.2.1 Laboratory Activity: Students will run tests to determine nutrients available in a variety of feedstuffs and make determinations as to additional feedstuffs required to provide a complete ration.

Skeletal and Muscular Systems

Standard 6 – Students become knowledgeable of skeletal systems while they study all aspects of bone injuries, bone interaction with each other, and other systems and diseases relating to the bone.

6.1 Objective: Demonstrate a basic knowledge of the skeleton using graphic and physical models of various animal skeletons.

6.1.1 Performance Indicator: Students will identify bone structures by name and classification.

6.1.1.1 Laboratory Activity: Bone dissection and ossification lab.

6.1.2 Performance Indicator: Student will be able to identify unique characteristics of bones and use those characteristics to identify their location in the body and bones it articulates with.

6.1.3 Performance Indicator: Students will be able to transfer knowledge of the skeletal system of one species to other species of agriculture and pet animals.

6.1.3.1 Laboratory Activity: Building a model of an animal skeleton.

6.2 Objective: Know the different types of bone fractures, healing process, and medical techniques for diagnosis of injury or bone impairment.

6.2.1 Performance Indicator: Students will identify different type of bone fractures and degree of seriousness the fracture exhibits.

6.2.2 Performance Indicator: Students will be able to identify various methods of imaging needed to gather information for diagnosing bone injuries.

6.2.3 Performance Indicator: Students will be able to perform appropriate procedures for bone injury treatment such as fractures, following a correct description of processes used to determine degree of the fracture and injury status.

6.3 Objective: Identify anatomy of joints, understand their interaction with other bones in their proximity and the soft tissue that relates to the function of those joints.

6.3.1 Performance Indicator: Students will be able to identify and classify joints given a description of the joint or location within the animal body.

6.3.1.1 Laboratory Activity: Building clay models of the joints.

6.3.2 Performance Indicator: Students will be able to describe the difference between ligaments and tendons; their function and distinguish how trauma and injury of these tissue effect the mobilization of the joint.

6.4 Objective: Have a working knowledge of the structure and functions associated with the muscular system.

6.4.1 Performance Indicator: Students will be able to identify the general functions of muscle tissue.

6.4.2 Performance Indicator: Students will be able to explain the levels of gross skeletal muscle organization.

6.4.3 Performance Indicator: Students will be able to recognize the microscopic anatomy of a skeletal muscle fiber.

6.4.4 Performance Indicator: Students will be able to describe the physiology of skeletal muscle fibers when action potentials are generated across the neuromuscular junction.

6.4.5 Performance Indicator: Students will be able to describe the three classes of lever systems.

Cardiovascular System

Standard 7 – Students gain knowledge of the heart muscle as they study anatomy and physiology of the organ and know methods used in monitoring and assessing the activity of the heart as well as how it relates to the endocrine digestive systems.

7.1 Objective: Understand and be able to demonstrate how the heart works; state how the chambers work and identify the chambers while explaining the pumping process, the flow of blood and rate; and name the vessels associated with the heart.

7.1.1 Performance Indicator: Students will gain knowledge of the major heart structures and identify those structures.

7.1.1.1 Lab Activity: Heart dissection.

7.1.2 Performance Indicator: Students will properly describe the workings of the heart and the associated major vessels connected to the heart while examining a specimen.

7.1.3 Performance Indicator: Students will note anomalies that can occur and build upon that knowledge by examining heart specimens.

7.1.4 Performance Indicators: Students will describe the physical and chemical composition of blood through the completion of a web quest.

7.1.5 Performance Indicators: Students will identify the blood cells and their functions through the completion of a web quest.

7.1.5.1 Laboratory Activity: Blood smear analysis.

7.1.5.2 Laboratory Activity: Taking a blood sample.

7.2 Objective: Understand the intrinsic and extrinsic regulation of the heart.

7.2.1 Performance Indicator: Students will compare and contrast intrinsic and extrinsic regulations that relate to reflexes in the heart.

7.2.2 Performance Indicator: Students will identify blood pressure as it relates to blood flow.

7.3 Objective: Gain an understanding of the electrical conduction system of the heart.

7.3.1 Performance Indicator: Students will demonstrate their understanding of the unique mechanisms of the heart muscle and its action potential to all cardiac cells.

7.3.2 Performance Indicator: Students will demonstrate their ability to collect, analyze, and interpret data relating to electrocardiograph (ECG).

7.3.3 Performance Indicator: Students will use case studies to apply their understanding of the heart and be able to identify electrical events of the heart that cause irregularities, such as myocardial infarctions and determine a regiment of care.

7.3.4 Performance Indicator: Students will be able to describe various situational, induced, and physical variables which affect the heart.

7.4 Objective: Demonstrate their knowledge of how the heart muscles' interaction with the vascular resistance as it applies to blood pressure and general health of the cardiovascular system.

7.4.1 Performance Indicator: Students will demonstrate their ability to accurately measure pulse rate on a variety of animal patients.

7.4.1.1 Laboratory Activity: Measuring blood pressure on cat manikin.

7.4.2 Performance Indicator: Students will demonstrate their ability to monitor sounds of the heart on patients and identify those sounds (e.g. heart murmurs, stenoses).

7.4.2.1 Laboratory Activity: Listening to heart sounds on dog manikin.

7.5 Objective: Complete an animal cardiopulmonary resuscitation course and demonstrate their ability to correctly apply CPR to a variety of animal species.

7.5.1 Performance Indicator: Students will know and demonstrate the differences of CPR practices used and under what circumstances.

7.5.1.1 Laboratory Activity: CPR on cat and dog manikin.

Respiratory System

Standard 8 – Students know how the complementary activity of major body systems provides cells with oxygen and removes toxic waste products such as carbon dioxide.

8.1 Objective: Identify the structures and functions of the respiratory system.

8.1.1 Performance Indicators: Students will be able to identify the organs of the respiratory system and describe the functions of each.

8.1.1.1 Laboratory Activity: dissection of swine trachea and lungs.

8.1.2 Performance Indicator: Students will be able to explain the process of oxygen exchange within the lungs.

Lymphatic and Immune Systems

Standard 9 – Students gain knowledge and understanding of the network of vessels within the lymphatic system. They will also understand the composition of biochemical travel of fluid within the lymphatic system which works in conjunction with the immune system.

9.1 Objective: Identify the structures and functions of the lymphatic system.

9.1.1 Performance Indicator: Students will learn that lymphatic pathways begin with lymphatic capillaries.

9.1.2 Performance Indicator: Students will identify the lymphatic pathway system by labeling and identifying their location in various animal bodies.

9.1.3 Performance Indicator: Students will identify the three parts of the lymph movement and identify the lymph nodes, and their microorganisms, lymphocytes and macrophages and how those cells function within the pathway.

9.1.4 Performance Indicator: Students will identify the microorganisms their function and their relationship to the node and connective tissue.

9.1.5 Performance Indicator: Students will gain knowledge of the thymus and spleen organs and their relationship to the lymphatic system.

9.2 Objective: Fully describe specific immunity and body defenses as they identify lymphatic systems function, barriers, and cellular operations.

9.2.1 Performance Indicator: Students will be able to describe the operations of antigens, the cellular immunity response system and autoimmunity.

9.2.2 Performance Indicator: Students will examine the cellular purpose of each type of leukocyte in the immune system.

9.2.3 Performance Indicator: Students will examine and describe the antibody and antigen reactions integral to the immune response system.

9.2.3.1 Laboratory Activity: Students will explore various common pathogens on prepared slides.

9.3 Objective: Identify methods of disease prevention and early diagnosis.

9.3.1 Performance Indicator: Students will be able to take vital signs of various animals using a variety of accepted methods and compare those results to acceptable rates.

9.3.1.1 Laboratory Activity: Examining animals for signs of poor and good health.

9.3.2 Performance Indicator: Students will know the role of the skin in providing nonspecific defenses against infection.

9.3.3 Performance Indicator: Students will know how vaccination protects an individual from infectious diseases.

9.3.3.1 Laboratory Activity: Administering a vaccine using proper procedures.

9.3.4 Performance Indicator: Students will be able to develop a vaccination protocol for a given species of livestock/pet animal.

9.3.5 Performance Indicator: Students will know the role of passive and active immunization.

Nervous System

Standard 10 – Students build upon their general understanding of the operational functions of the nervous system.

10.1 Objective: Distinguish between two types of cells which make up the nervous tissues and the two groups of the nervous system organs and neuronal pathways.

10.1.1 Performance Indicator: Students will be able to identify the types of neurons and their functions. They will be able to label the two types of systems and discuss how they relate.

10.1.2 Performance Indicator: Students will define neurotransmitters and describe their function.

10.1.3 Performance Indicator: Students will be able to classify, diagram, and label the parts of a neuron.

10.2 Objective: Know the differences between the central (CNS) and peripheral (PNS) systems and describe how they work in conjunction.

10.2.1 Performance Indicator: Students will be able to classify neurons by size, structure and shape of their cell bodies while discussing how they relate to the CNS and the peripheral nervous system.

10.2.2 Performance Indicator: Students will be able to describe the organizational structure of the nerve tissue.

10.2.3 Performance Indicator: Students will list the parts of the brain and state their function.

10.2.4 Performance Indicator: Students will be able to diagram the structure of the spinal cord.

10.2.5 Performance Indicator: Students will know the roles of sensory neurons, interneurons, and motor neurons in sensation, thought, and response.

10.2.5.1 Laboratory Activity: Sensory perception and reflexes lab.

Reproductive and Endocrine Systems

Standard 11 – Students understand the main regulatory functions of the endocrine system and how it affects all other systems in the body. Students will understand the role of hormones in animal reproduction and be able to identify the structures involved in reproduction and identify their functions.

11.1 Objective: Describe the means by which the nervous and endocrine systems regulate body functions.

11.1.1 Performance Indicator: Students will be able to list components of the endocrine system i.e.; chemical signals, receptors, hormones, glands, hormones, and their function.

11.1.2 Performance Indicator: Students will understand the process of intercellular chemical receptors and how chemicals and receptors produce response in their targeted tissues.

11.1.3 Performance Indicator: Students will know how hormones (including digestive, reproductive, and osmoregulatory) provide internal feedback mechanisms for homeostasis at the cellular level and in whole organisms.

11.1.4 Performance Indicator: Students will be able to identify the endocrine glands, their locations, and hormones produced.

11.2 Objective: Know how the components of the endocrine system interact, such as the relationship between chemical signal and its receptors; endocrine glands and their hormones and glucagon and insulin.

11.2.1 Performance Indicator: Students will be able to identify the functions of the various hormones produced by the mammalian body.

11.2.2 Performance Indicator: Students will understand the pancreas and how insulin relates to diabetes.

11.2.3 Performance Indicator: Students will be able to identify common diseases associated with hormone malfunction in the animal body.

11.3 Objective: Understand animal reproduction including the function of reproductive organs.

11.3.1 Performance Indicator: Students will observe and label the reproductive organs of a female and male mammal.

11.3.1.1 Laboratory Activity: Dissection of a cow reproductive tract.

11.3.2 Performance Indicator: Students will be able to describe variations in conception in various species of agriculture and pet animals including estrus cycles, ovulation, and insemination.

11.3.3 Performance Indicator: Students will be able to explain the gestation process and basic fetal development in animal reproduction.

11.3.4 Performance Indicator: Students will be able to describe the parturition process, including the identification of potential problems and their solutions.

11.3.5 Performance Indicator: Students will be able to give reasons for artificial insemination and embryo transfer in animal agriculture.

11.3.6 Performance Indicator: Students will be able demonstrate, discuss, and prepare a report on the process of artificial insemination and semen fertility.

11.3.6.1 Laboratory Activity: Analyzing bull semen motility.

11.3.6.2 Laboratory Activity: Artificially inseminating a cow reproductive tract.

Integument System

Standard 12 – Students gain an understanding of the structure, function, and associated vital signs of the integument system and the role it plays in maintaining homeostasis of the individual.

12.1 Objective: Describe irregularities in skin appearance and what they indicate about health status.

12.1.1 Performance Indicator: Students will be able to identify various conditions of the skin and identify possible causes.

12.2 Objective: Understand the physiological processes necessary for tissue repair and wellness.

12.2.1 Performance Indicator: Students will describe the body's reaction to injury as it relates to the different stages of injury.

12.2.2 Performance Indicator: Students will be able to identify different types of superficial injuries, including but not limited to inflammation response, bacterial infection, and formation of new tissues during cellular repair while describing the cellular response to injury.

12.2.3 Performance Indicator: Students will demonstrate appropriate application of first aid techniques in response to injury as well as demonstrate knowledge of those techniques in a variety of situations of injury (e.g. triage, wounds, dressings, sterilization, and positioning).

12.2.3.1 Laboratory Activity: Techniques in bandaging wounds on animal manikins.

Animal Science and Veterinary Medicine Applications

Standard 13 – Students develop an understanding of skills and behaviors required to work efficiently, sensitively, and successfully with patients and their owners in a veterinary hospital or farm facility setting.

13.1 Objective: Have knowledge of general physiology to assess individuals; noting irregularities in appearance, behavior, breathing, heart rate, skin color, and the eyes.

13.1.1 Performance Indicator: Students will be able to compare and contrast signs of poor and good health in animals.

13.1.2 Performance Indicator: Students will be able to effectively evaluate a patient for physical signs of poor health.

13.2 Objective: Learn to perform professionally while assessing the needs of patients.

13.2.1 Performance Indicator: Students will practice communication skills through real-life scenarios in the classroom. This practice includes patient assessment while addressing the needs of family members.

13.2.2 Performance Indicator: Students will practice communication with job shadow experiences at real veterinary care facilities.

13.2.3 Performance Indicator: Students will understand the legal requirements for the storage, methods of application, and withdrawal times of animal medications and know proper equipment handling and disposal techniques.

13.2.3.1 Laboratory Activity: Administering medications to animals and treat livestock for various illnesses.

13.3 Objective: Demonstrate their ability to correctly measure patient pulse rate, temperature, blood pressure, pupil response, and respiration rate.

13.3.1 Performance Indicator: Students will document patient vital signs over a designated period of time to demonstrate their ability to graph trends and detect irregularities in patients.