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PROGRAM CONCENTRATION: **Agricultural Education**
CAREER PATHWAY: ***Additional Course for the Animal Science Pathway**
COURSE TITLE: **Equine Science**

Course Description: This laboratory course is designed to introduce students to the scientific principles that underlie the breeding and husbandry of horses and the production, care, and management of horses.

AG-ES-1. Students will be able to recognize the different breeds, types, and classes of horses as well as describing the evolution of the horse and its domestication and value in history.

a. Classify the horse scientifically.
b. Describe the characteristics of horses that allowed them to be domesticated.
c. Describe the various breeds of horses.
d. Describe how breeds of horses were developed.

Academic Standards:
SB1 The student analyzes the nature of the relationships between structures and functions in living cells.

SB2 The student analyzes how biological traits are passed on to successive generations.

SB5 The student evaluates the role of natural selection in the development of the theory of evolution.

AG-ES-2. Students will demonstrate a working knowledge of the anatomy of the horse and describe the mechanisms that allow a horse to move.

a. Explain the importance of cells and their function to the horse.
b. Identify the parts of animal cells.
c. List the major organs that make up each system of the horse.
d. Name three types of muscle fibers and identify their function.
e. Identify the leg muscles that control movement.

Academic Standards:
SB3 The student derives the relationship between single-celled and multi-celled organisms and the increasing complexity of systems.

SEV1 The student investigates the flow of energy and cycling of matter within an ecosystem and relates these phenomena to human society.

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HS-ATS-8 The student analyzes the anatomy, physiology and basic pathophysiology of each of the body's systems and apply knowledge in performance of evaluating, monitoring, and treatment of client(s) and/or simulations.

AG-ES-3. Students will identify common problems in the structure of a horse.

a. Describe the problems that are caused by unsoundness.
b. Name and describe unsound conditions of the legs or skeletal system.
c. Describe how to methodically examine a horse for soundness.
d. Recognize problems that should be treated by a veterinarian.

Academic Standards:
HS-ATS-8 The student analyzes the anatomy, physiology and basic pathophysiology of each of the body's systems and apply knowledge in performance of evaluating, monitoring, and treatment of client(s) and/or simulations.

AG-ES-4. Students will be able to select horses based on their use.

a. Discuss why conformation is more important than breed when selecting a horse.
b. Identify typical markings for the face and legs of horses.
c. Select horses based on their desirability.

Academic Standards:
SAP1(a)(b) The student analyzes anatomical structures in relationship to their physiological functions.

SSEF4 (b) The student compares and contrasts different economic systems and explain how they answer the three basic economic questions of what to produce, how to produce, and for whom to produce.

AG-ES – 5. Students will be able to describe the process of gene transfer in horses and determine how the science of genetics is used.

a. Define gene, allele, and chromosome.
b. Distinguish between DNA and RNA.
c. Distinguish between phenotypic and genotypic traits.
d. Describe the relationship between dominant and recessive traits.
e. Identify genetic abnormalities.

Academic Standards:
SB1 The student analyzes the nature of the relationships between structures and functions in living cells.

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SB2 The student analyzes how biological traits are passed on to successive generations.

SB3 The student derives the relationship between single-celled and multi-celled organisms and the increasing complexity of systems.

SB5 The student evaluates the role of natural selection in the development of the theory of evolution.

AG-ES-6. Students will be able to discuss the reproductive process and explain how it is used in breeding programs.

a. List and describe the major parts of the female and male reproductive tract.
b. Describe hormones that control the reproductive process.
c. Discuss different types of breeding programs.
d. Explain the advantages of artificial insemination.
e. Describe the process of embryo transfer.

Academic Standards:
SB1 The student analyzes the nature of the relationships between structures and functions in living cells.

SB2 The student analyzes how biological traits are passed on to successive generations.

AG-ES-7. Students will be able to discuss the digestive system of the horse and explain nutritional needs.

a. Distinguish between simple stomach, ruminant, and the cecum digestive systems.
b. Describe the function of the small and large intestine.
c. Describe the symptoms of nutrient deficiencies.
d. Describe the function of nutrients within the body.
e. Develop a feeding program for horses.

Academic Standards:
SB1 (c) The student identifies the function of the four major macromolecules (i.e., carbohydrates, proteins, lipids, nucleic acids).

SB3 The student derives the relationship between single-celled and multi-celled organisms and the increasing complexity of systems.

SES6 (a) The student relates the nature and distribution of life on Earth, including humans, to the chemistry and availability of water.

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SAP4 The student analyzes the physical, chemical and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.

AG-ES-8. Students will recognize the common diseases of the horse and prescribe preventive measures and management practices.

a. Describe signs of disease in horses.
b. Discuss how diseases are transmitted.
c. Describe ways in which disease can be prevented.
d. Plan a vaccination program for horses.

Academic Standards:
HS-ATS-4 The student demonstrates the proper implementation of safe work practices to prevent injury or illness as designated by each class, laboratory, clinical site, and/or facility's safety protocol. (a) The student analyzes existing and potential exposure risks to clients, co-workers, and self in healthcare setting. (b) The student demonstrates adherence to standards, and guidelines for Center for Disease Control and Prevention (CDC), Occupational Safety and Health Administration (OSHA), Federal Drug Administration (FDA), Clinical Laboratory Improvement Amendments (CLIA), and Department of Technical and Adult Education (DTAE), and other applicable regulatory agencies' guidelines. (c) The student contrasts surgical technique and medically aseptic technique.

SAP4 The student analyzes the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.

AG-ES-9. Students will demonstrate an understanding of the parts of the horse's hoof and how to care for the foot.

a. Discuss the importance of healthy feet as it relates to the overall health of the horse.
b. Explain the three main functions of the hoof wall.
c. Explain the importance of daily foot inspection.
d. List common problems of the feet.
e. List the tools and equipment necessary to shoe a horse.
f. Describe the process of shoeing a horse.

Academic Standards:
HS-ATS-8: The student analyzes the anatomy, physiology and basic pathophysiology of each of the body's systems and applies knowledge in performance of evaluating, monitoring, and treatment of client(s) and/or simulations.

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AG-ES-10. Students will be able to describe the housing, shelters, and facilities needed to care for horses.

a. Identify the space requirement for a horse.
b. Describe the safety requirements for a horse facility.
c. List the requirements for feeding and watering horses.
d. Describe the reasons for building fences.
e. Describe the proper procedure for building a horse fence.

Academic Standards:
SCSh3. The student identifies and investigates problems scientifically.

MM3D3. The student understands the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

MM3P1. The student solves problems (using appropriate technology).

AG-ES-11. Students will be able to discuss the various types of behavior associated with horses.

a. Define the term behavior.
b. Name and describe 10 different behavioral categories associated with horses.
c. Describe the sense of the vision, touch, smell, and hearing of the horse.
d. Discuss how natural behavior is used to train a horse.
e. Describe the role of the sense of touch in training.
f. Outline a proper exercise program for horses.

Academic Standards:
SCSh4 The student uses tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh3. The student identifies and investigates problems scientifically.

AG-ES-12. Students will demonstrate an understanding of career opportunities in livestock production and management.

a. Explain the value of an agricultural background for the individual entering a livestock-related occupation.
b. List employment opportunities which require knowledge of animal science.
c. Describe the process of choosing an occupation.
d. Submit a resume.

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Academic Standards:

SCSh9 The student enhances reading in all curriculum areas.

ELA10RC4 (a) Explores life experiences related to subject area content. (b) Discusses in both writing and speaking how certain words and concepts relate to multiple subjects.

AG-ES-13. Students will demonstrate an understanding of ethics in livestock and how livestock production affects the environment.

a. Describe livestock production problems relating to the environment.
b. Describe the role of livestock in conjunction with food supply and food-animal regulations.

Academic Standards:

ELA10LSV1 (c) The student responds to questions with appropriate information. (d) The student actively solicits another person's comments or opinion.

ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, and evaluates solution).

ELA10LSV1 (e) The student offers own opinion forcefully without domineering. (f) The student contributes voluntarily and responds directly when solicited by teacher or discussion leader. (g) The student gives reasons in support of opinions expressed.

SCSh6 The student communicates scientific investigations and information clearly.

SB4 The student assesses the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

AG-ES-14. Students will become oriented to the comprehensive program of agricultural education, learn to work safely in the agriculture lab and work sites, demonstrate selected competencies in leadership through the FFA and agricultural industry organizations, and develop plans for a supervised agricultural experience program.

a. Explain the role of the Agriculture Education program and the FFA in personal development.
b. Demonstrate knowledge learned through a Supervised Agricultural Experience Program (SAEP).
c. Develop leadership and personal development skills through participation in the FFA.

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d. Explore career opportunities in animal science through the FFA and Agriculture Education Program.
e. Explore the professional agricultural organizations associated with the course content.

Academic Standards:
ELA10C1 The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.

SCSh2. The student uses standard safety practices for all classroom laboratory and field investigations.

ELA10LSV1 (d) The student actively solicits another person's comments or opinion. (e) The student offers own opinion forcefully without domineering.

ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).

ELA10LSV1 (e) The student offers own opinion forcefully without domineering. (f) The student contributes voluntarily and responds directly when solicited by teacher or discussion leader. (g) The student gives reasons in support of opinions expressed.

Reading Across the Curriculum

Reading Standard Comment
After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in *context*.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

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Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

CTAE-RC-1 Students will enhance reading in all curriculum areas by:

Reading in All Curriculum Areas

-Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
-Read both informational and fictional texts in a variety of genres and modes of discourse.
-Read technical texts related to various subject areas.

Discussing Books

-Discuss messages and themes from books in all subject areas.
-Respond to a variety of texts in multiple modes of discourse.
-Relate messages and themes from one subject area to messages and themes in another area.
-Evaluate the merit of texts in every subject discipline.
-Examine author's purpose in writing.
-Recognize the features of disciplinary texts.

Building Vocabulary Knowledge

-Demonstrate an understanding of contextual vocabulary in various subjects.
-Use content vocabulary in writing and speaking.
-Explore understanding of new words found in subject area texts.

Establishing Context

-Explore life experiences related to subject area content.
-Discuss in both writing and speaking how certain words are subject area related.
-Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education

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Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

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CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.