CareerClusters® PATHWAYS TO COLLEGE & CAREER READINESS
Agriculture, Food & Natural Resources

Learning that works for Colorado CTE®

Colorado CTE Course – Scope and Sequence

Course Name	**Advanced Veterinary Science A**		**Course Details** **Course = 0.50 Carnegie Unit Credit**	Level 4 course in the Animal Science Pathway. Third of four semesters in Vet Science strand.	
Course Description	Students will focus on advanced animal behavior and handling, positioning and restraint for surgical procedures, pharmacology, Asepsis, hospital and surgical procedures, antibiotics and antibiotic resistance, laboratory testing and procedures as well as veterinary technologies. Current animal agricultural issues will be researched and addressed. The scientific processes of observation, hypothesizing, data gathering, interpretation, analysis and application will be included. Career opportunities and educational preparation will be examined. Learning activities are varied with classroom, laboratory and field experiences will be included.				
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #	18105	Schedule calculation based on 60 % of instructional time in the semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**					
Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Unit 1: Health and Disease ● Animal Health ● Animal Behavior ● Diseases ● Disorders ● Parasites	35%	**AS.02.** Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare **AS.06.** Classify, evaluate and select animals based on anatomical and physiological characteristics.	A**S.02.01.** Demonstrate management techniques that ensure animal welfare. *SCIENCE: NGSS.HS.ETS.1.2* **AS.06.01.** Classify animals according to taxonomic classification systems and use (e.g. agricultural, companion, etc.). **AS.06.02.** Apply principles of comparative	**AS.02.01.02.a.** Research and summarize the challenges involved in working with animals and resources available to overcome them (e.g., tools, technology, equipment, facilities, animal behavior signals, etc.). **AS.06.01.01.c** Assess taxonomic characteristics and classify animals according to the taxonomic classification system. **AS.06.02.03.a** Identify and summarize the properties, locations, functions and types of animal cells, tissues, organs and body systems.	Veterinary Science CDE

			anatomy and physiology to uses within various animal systems. *SCIENCE: SC.HS.2.1. SC.HS.2.2*	**AS.06.02.03.b** Compare and contrast animal cells, tissues, organs, body systems types and functions among animal species.	
		AS.07. Apply principles of effective animal health care.	**AS.07.01.** Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare. *MATH:MA.HS.N.Q.A*	**AS.07.01.03.a** List and summarize the characteristics of wounds, common diseases, parasites and physiological disorders that affect animals. **AS.07.01.01.a.** Identify and summarize specific tools and technology used in animal health management. **AS.07.01.01.b.** Describe and demonstrate the proper use and function of specific tools and technology related to animal health management. **AS.07.01.01.c**. Select and use tools and technology to meet specific animal health management goals. **AS.07.01.05.a.** Explain the clinical significance of common veterinary methods and treatment (e.g., aseptic techniques, antibiotic use, wound management, etc.)	
		CS.03. Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces.	**CS.03.04** Use appropriate protective equipment and demonstrate safe and	**CS.03.04.01.a.** Identify and differentiate the appropriate protective equipment for the safe use and operation of specific tools and equipment (e.g. PPE, etc.).	

			proper use of AFNR tools and equipmen	**CS.03.04.02.b.** Complete the set up and adjustment for tools and equipment related to AFNR tasks. **CS.03.04.03.b.** Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR tools and equipment.CRP.04.02.01.a	
Unit 2: Pharmacology • Mathematical applications in Veterinary Science • Dosage Administration	25%	**AS.07.** Apply principles of effective animal health care	**AS.07.01.** Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare. *MATH:MA.HS.N.Q.A*	**AS.07.01.01.a** Identify and summarize specific tools and technology used in animal health management. **AS.07.01.01.b** Describe and demonstrate the proper use and function of specific tools and technology related to animal health management. **AS.07.01.03.c** Treat common diseases, parasites and physiological disorders of animals according to directions prescribed by an animal health professional. **AS.07.01.05.a** Explain the clinical significance of common veterinary methods and treatment (e.g., aseptic techniques, antibiotic use, wound management, etc.).	

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Course Name	Advanced Veterinary Science B	Course Details **Course = 0.50 Carnegie Unit Credit**	Level 4 course in the Animal Science pathway. Fourth of four semesters in the Vet Science strand.
Course Description	Students will develop knowledge, skills and understanding in the biological processes and physiological systems found in livestock and companion animal species including anatomy and physiology, growth and development, muscular and skeletal systems, integumentary system, respiratory and circulatory systems, nervous system, lymphatic and endocrine systems and excretory system. The scientific processes of observation, hypothesizing, data gathering, interpretation, analysis and application will be included. Career opportunities and educational preparation will be examined. Learning activities are varied with classroom, laboratory and field experiences will be included.		
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.		
SCED Identification #	18105	Schedule calculation based on 60 calendar days of a 90-day semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.	

All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**

Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Veterinary Medical Practices ● Animal Handling & Identification ● Vital Signs ● Blood Samples ● Injections ● Clinical Examinations ● Laboratory Procedures ● Hospital Procedures ● Surgical Procedures	60%	**AS.02.** Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare. **AS.06.** Classify, evaluate and select animals based on anatomical and physiological characteristics. **AS.07.** Apply principles of effective animal health care.	**AS.02.01.** Demonstrate management techniques that ensure animal welfare. *SCIENCE: NGSS.HS.ETS1.2* **AS.06.02.** Apply principles of comparative anatomy and physiology to uses within various animal systems. *SCIENCE: SC.HS.2.1* **AS.07.01**. Design programs to prevent	**AS.02.01.02.a** .Research and summarize the challenges involved in working with animals and resources available to overcome them (e.g., tools, technology, equipment, facilities, animal behavior signals, etc.). **AS.06.02.03.c.** Apply knowledge of anatomical and physiological characteristics of animals to make production and management decisions. **AS.07.01.01.a** Identify and summarize specific tools and technology used in animal health management. **AS.07.01.01.b** Describe and	

			animal diseases, parasites and other disorders and ensure animal welfare. *MATH: MA.HS.N.Q.A*	demonstrate the proper use and function of specific tools and technology related to animal health management. **AS.07.01.01.c** Select and use tools and technology to meet specific animal health management goals. **AS.07.01.02.a** Explain methods of determining animal health and disorders. **AS.07.01.02.b** Perform simple health-check evaluations on animals and practice basic emergency response procedures related to animals. **AS.07.01.03.a** List and summarize the characteristics of wounds, common diseases, parasites and physiological disorders that affect animals. **AS. 07.01.05.a** Explain the clinical significance of common veterinary methods and treatment (e.g., aseptic techniques, antibiotic use, wound management, etc.).	
		CS.03. Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces	**CS.03.04.** Performance Indicator: Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.	**CS.03.04.02.b.** Complete the set up and adjustment for tools and equipment related to AFNR tasks. **CS.03.04.03.b.** Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR tools and equipment.	

CAS Academic Standards Alignment: Online Version: https://www.cde.state.co.us/apps/standards/**;** Download version: https://www.cde.state.co.us/apps/standards/

Reading, Writing, and Communicating:

Math:

- MA.HS.N-Q.A – Quantities: Reason quantitatively and use units to solve problems.

Science:

- SC.HS.2.1 – DNA codes for the complex hierarchical organization of systems that enable life's functions.
- SC.HS.2.2 – Growth and division of cells in complex organisms occurs by mitosis, which differentiates specific cell types.
- NGSS.HS.ETS.1,2 – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Essential Skills:

Problem Solver:

- Critical Thinking and Analysis: The ability to apply a deliberate process of identifying problems, gathering information, and weighing possible solutions, including: making choices rooted in understanding patterns, cause-and-effect relationships, and the impacts that a decision can have on the individual and others.

Community Member:

- Global and cultural awareness: the ability to collaborate with individuals from diverse backgrounds and/or cultures to address national and global issues, and to develop complex, appropriate, and workable solutions.

Empowered Individual:

- Self-Awareness: the ability to understand one's own emotions, thoughts, and values, and how personal actions and emotions influence behavior across contexts, including: the capacity to recognize one's strength and limitations with a well-grounded sense of confidence and purpose.
- Self-Management: the ability to manage one's emotions, thoughts, and behaviors effectively in different situation and to achieve goals and aspirations, including: the capacity to delay gratification, manage stress, stay productive and accountability, and feel motivation & agency to accomplish personal/collective goals.
- Career Awareness: The ability to apply the knowledge and understanding of how one's dreams, experiences, and interests translate into career fulfillment and lifelong pursuits in local, regional, national, and global career pathways and opportunities.

Communicator:

- Interpersonal communication: the ability to establish and maintain healthy and supportive relationships, including: the capacity to communicate clearly by successfully conveying information and feelings, listening actively, setting boundaries, negotiating conflict constructively, and seeking or offering support and help when needed.
- Data Literacy: the ability to identify, collect, evaluate, analyze, interpret, present, and protect data.