Colorado CTE Course – Scope and Sequence

Course Name	**Intermediate Veterinary Science A**		**Course Details** **Course = 0.50 Carnegie Unit Credit**	Level 3 course in the Animal Science pathway course sequence. First of four semesters in Vet Science strand.	
Course Description	Students will develop knowledge, skill and understanding in the biological processes and physiological systems found in livestock and companion animal species pertaining to Animals 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 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 % of Instructional Time**	**CTE or Academic Standard Alignment**	**Competency / Performance Indicator**	**Outcome / Measurement**	**CTSO Integration**
Careers	3 %	**CS.05.** Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources career pathways.	**CS.05.01.** Evaluate and implement the steps and requirements to pursue a career opportunity in each of the AFNR career pathways (e.g., goals, degrees, certifications, resumes, cover letter, portfolios, interviews, etc.) **CS.05.02.** Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.	**CS.05.01.01.b.** Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway. **CS.05.01.02.b.** Analyze personal skillset and create a plan for obtaining the required education, training and experiences to obtain a career in an AFNR pathway. **CS.05.01.03.b.** Assess personal goals, experiences, education and skillsets and organize them to produce the appropriate tools and develop the skills to effectively communicate about one's qualifications for an AFNR	

				career. **CS.05.02.02.a.** Research and describe careers in each of the AFNR pathways and choose potential careers connecting to personal interests and skills.	
The Roles of Animal in Society ● Animal Uses ● Animal Rights and Animal Welfare ● Human Animal Bond ● Companion Animals versus Production Animals ● Animals in Research ● Livestock Companion Animal Species and Breed Taxonomy and Identification	22%	**AS.01.** Analyze historic and current trends impacting the animal systems industry. **AS. 02.** Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.	**AS.01.01.** Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment. **AS.02.01.** Demonstrate management techniques that ensure animal welfare.	**AS.01.01.01.a** Identify and summarize the origin, significance, distribution and domestication of different animal species. **AS.01.01.01.b** Evaluate and describe characteristics of animals that developed in response to the animal's environment and led to their domestication. **AS.01.01.01.c** Evaluate the implications of animal adaptations on production practices and the environment. **AS.01.01.02.b** Describe the historical and scientific developments of different animal industries and summarize the products, services and careers associated with each. **AS.02.01.01.a.** Explain the implications of animal welfare and animal rights for animal systems. **AS.02.01.01.c.** Implement and evaluate quality-assurance programs and	Veterinary Science CDE Livestock Evaluation CDE Prepared Public Speaking LDE

		AS.06. Classify, evaluate and select animals based on anatomical and physiological characteristics.	**AS.06.01.** Classify animals according to taxonomic classification systems and use (e.g. agricultural, companion, etc.).	procedures for animal production. **AS.02.01.03.a.** Distinguish between animal husbandry practices that promote animal welfare and those that do not. **AS.06.01.02.a** Compare and contrast major uses of different animal species (e.g., agricultural, companion, etc.). **AS.06.01.03.b** Analyze the visual characteristics of an animal or animal product and select correct classification terminology when referring to companion and production animals. **AS.06.03.03.a** Research and summarize the use of products and by-products derived from animals.	
Veterinary Business Management ● Animal Care Career Opportunities ● Personal Safety and Hazards ● Medical Records ● Veterinary Laws & Ethics	35%	**CS.05. CCTC Standard:** Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources career pathways.	**CS.05.01. Performance Indicator:** Evaluate and implement the steps and requirements to pursue a career opportunity in each of the AFNR career pathways (e.g., goals, degrees, certifications, resumes, cover letter, portfolios, interviews, etc.).	**CS.05.01.01.b.** Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway. **CS.05.01.02.a.** Examine the educational, training and experiential requirements to pursue a career in an AFNR pathway (e.g., degrees, certifications, training, internships, etc.).	Veterinary Science CDE Livestock Evaluation CDE Prepared Public Speaking LDE Employment Skills CDE

• Common Veterinary Medical Equipment • Veterinary Medical Terms & Terminology •		**AS.01. CCTC Standard:** Analyze historic and current trends impacting the animal systems industry	**AS.01.02.** Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.	**CS.05.01.02.b.** Analyze personal skillset and create a plan for obtaining the required education, training and experiences to obtain a career in an AFNR pathway. **AS.01.02.01.b.** Analyze the impact of animal production methods on end product qualities (e.g., price, sustainability, marketing, labeling, animal welfare, etc.). **AS.01.02.01.c.** Evaluate the effectiveness of different production methods and defend the use of selected methods using data and evidence. **AS.01.02.03.a.** Summarize the types, purposes, and characteristics of effective record keeping and documentation practices for animal systems enterprises (e.g., managing records for animal identification, feeding, breeding, treatment, income/expense, etc.).	
		AS. 02. Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.	**AS.02.01.** Demonstrate management techniques that ensure animal welfare.	**AS.02.01.01.a.** Explain the implications of animal welfare and animal rights for animal systems. **AS.02.01.02.b.** Analyze and document animal welfare procedures used to ensure safety and maintain low stress when moving and restraining animals. **AS.02.01.02.c**	

				Devise, implement and evaluate safety procedures and plans for working with animals by species using information based on animal behavior and responses. **AS.02.01.03.b** Analyze and document animal husbandry practices and their impact on animal welfare.	
			AS.02.02. Analyze procedures to ensure that animal products are safe for consumption (e.g., use in food system, etc.).	**AS.02.02.02.b.** Analyze consumer concerns with animal production practices relative to human health.	
		AS.04. Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production. **AS.06.** Classify, evaluate and select animals based on anatomical and physiological characteristics.	**AS.04.02.** Apply scientific principles to select and care for breeding animals. **AS.06.02.** Apply principles of comparative anatomy and physiology to uses within various animal systems. **AS.06.03.** Select and train animals for specific	**AS.04.02.04.a** Identify and summarize different needs of breeding animals based on their growth **AS.06.02.03.a** Identify and summarize the properties, locations, functions and types of animal cells, tissues, organs and body systems. **AS.06.02.03.b** Compare and contrast animal cells, tissues, organs, body systems types and functions among animal species. **AS.06.03.02.a**	

			purposes and maximum performance based on anatomy and physiology.	Evaluate an animal against its optimal anatomical and physiological characteristics.	
		AS.07. Apply principles of effective animal health care.	A**S.07.01.** Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.	**AS.07.01.01.b** Describe and demonstrate the proper use and function of specific tools and technology related to animal health management. **AS.07.01.02.a** Explain methods of determining animal health and disorders. **AS.07.01.04.b** Research and analyze data to evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.	
		CS.03. CCTC Standard: Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces.	**CS.03.01. Performance Indicator:** Identify and explain the implications of required regulations to maintain and improve safety, health and environmental management systems. **CS.03.04. Performance Indicator:** Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.	**CS.03.01.02.a.** Summarize the importance of safety, health and environmental management in the workplace. **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.). **CS.03.04.02.a.** Identify standard tools, equipment and safety	

				procedures related to AFNR tasks. **CS.03.04.03.a.** Read and interpret operating instructions related to operation, storage and maintenance of tools and equipment related AFNR tasks.	

Colorado CTE Course – Scope and Sequence

Course Name	**Intermediate Veterinary Science -B**	**Course Details** **Course = 0.50 Carnegie Unit Credit**	**Level III course in the Animal Science pathway course sequence. Second of four semesters in Vet Science strand.**
Course Description	Students will develop knowledge, skill and understanding in the biological processes and physiological systems found in livestock and companion animal species 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 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 % of Instructional Time**	**CTE or Academic Standard Alignment**	**Competency / Performance Indicator**	**Outcome / Measurement**	**CTSO Integration**
Anatomy and Physiology • External Anatomy of Companion Animals • External Anatomy of Livestock • Organ Systems • Nutrition	**35%**	**AS.02. Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare.**	**AS.02.01. Demonstrate management techniques that ensure animal welfare.**	**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.03.01.01.a**	**Veterinary Science CDE**

• Reproduction and Genetics		**AS.03. Design and provide proper animal nutrition to achieve desired outcomes for performance, development, reproduction and/or economic production.**	**AS.03.01. Analyze the nutritional needs of animals.**	**Identify and summarize essential nutrients required for animal health and analyze each nutrient's role in growth and performance.** **AS.03.01.01.b** **Differentiate between nutritional needs of animals in different growth stages and production systems (e.g., maintenance, gestation, natural, organic, etc.).** **AS.03.01.01.c** **Assess nutritional needs for an individual animal based on its growth stage and production system.** **AS.03.01.02a** **Differentiate between nutritional needs of animal species.** **AS.03.01.02b** **Correlate a species' nutritional needs to feedstuffs that could meet those needs.**	
			AS.03.02 Analyze feed rations and assess if they meet the nutritional needs of animals.	**AS.03.02.01a** **Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.** **AS.03.02.01b** **Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.**	

				AS.03.02.01c **Select appropriate feedstuffs for animals based on a variety of factors (e.g., economics, digestive system and nutritional needs, etc.).** **AS.03.02.02a** **Examine the importance of a balanced ration for animals based on the animal's growth stage (e.g., maintenance, newborn, gestation, lactation, etc.).** **AS.03.02.02.b** **Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and performance.**	
			AS.03.03Utilize industry tools to make animal nutrition decisions.	**AS.03.03.01a** **Identify and categorize tools and equipment used to meet animal nutrition needs and ensure an abundant and safe food supply.** **AS.03.03.02.a** **Examine and summarize the meaning of various components of feed labels and feeding directions.** **AS.03.03.02.b** **Analyze and apply information from a feed label and feeding directions to feed animals.**	
		AS.04. Apply principles of animal reproduction to achieve	**AS.04.02. Apply scientific principles to select and**	**AS.04.02.01.a.**	

		desired outcomes for performance, development and/or economic production.	care for breeding animals.	Summarize genetic inheritance in animals. AS.04.02.02.a. Identify and summarize inheritance and terms related to inheritance in animal breeding (e.g., dominate, co-dominate, recessive, homozygous, heterozygous, etc.). AS.04.02.02.b Demonstrate how to determine probability trait inheritance in animals. AS.04.02.02.c Select and evaluate breeding animals and determine the probability of a given trait in their offspring. AS.04.02.03.a Identify and summarize genetic defects that affect animal performance	
		AS.06. Classify, evaluate and select animals based on anatomical and physiological characteristics.	AS.06.02. Apply principles of comparative anatomy and physiology to uses within various animal systems.	AS.06.02.03.a. Identify and summarize the properties, locations, functions and types of animal cells, tissues, organs and body systems. 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	AS.07.01.01.a. Identify and summarize specific	

			disorders and ensure animal welfare.	**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.).**	
Biosecurity ● Disease Causing Organisms ● Biosecurity, Pathogen Control, Human and Animal Risks Associated with It ● Impacts of Biosecurity	**25%**	**CS.02. CCTC Standard:** Evaluate the nature and scope of the Agriculture, Food & Natural Resources Career Cluster and the role of agriculture, food and natural resources (AFNR) in society and the economy.	**CS.02.01. Performance Indicator:** Research and use geographic and economic data to solve problems in AFNR systems. **CS.02.02. Performance Indicator:** Examine the components of the AFNR systems and assess their impact on the local, state, national and global society and economy.	**CS.02.01.02.b.** Analyze and interpret a set of economic data and explain how it impacts an AFNR system. **CS.02.02.02.a.** Define and summarize societies on local, state, national and global levels and describe how they relate to AFNR systems. **CS.02.02.02.b.** Assess how people within societies on local, state, national and global levels interact with AFNR systems on daily, monthly or yearly basis.	Veterinary Science CDE Prepared Public Speaking LDE

				CS.02.02.02.c. Evaluate how society traditions, customs or policies have resulted from practices with AFNR systems. **CS.02.02.03.a.** Examine and summarize the components of the agricultural economy (e.g., environmental, crops, livestock, etc.). **CS.02.02.03.b.** Assess the economic impact of an AFNR system on a local, state, national and global level. **CS.02.02.03.c.** Evaluate how positive or negative changes in the local, state, national or global economy impacts AFNR systems.	
		CS.03. CCTC Standard: Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces.	**CS.03.01. Performance Indicator:** Identify and explain the implications of required regulations to maintain and improve safety, health and environmental management systems. **CS.03.02. Performance Indicator:** Develop and implement a plan to maintain and improve health, safety and environmental compliance and performance.	**CS.03.01.02.a.** Summarize the importance of safety, health and environmental management in the workplace. **CS.03.02.01.a.** Research and identify components required in health and safety performance plans. **CS.03.02.01.b.** Analyze the effectiveness of health and safety performance plans of an AFNR workplace. **CS.03.02.02.a.** Examine and categorize examples of	

		CS.06. CCTC Standard: Analyze the interaction among AFNR systems in the production, processing and management of food, fiber and fuel and the sustainable use of natural resources.	**CS.06.02. Performance Indicator:** Analyze and explain the connection and relationships between different AFNR systems on a national and global level.	environmental compliance plans from AFNR workplace. **CS.03.02.02.b.** Develop plans to improve environmental compliance and performance within an AFNR system. **CS.03.03. Performance Indicator:** Apply health and safety practices to AFNR workplaces. **CS.03.03.04.a.** Examine and categorize the risk level of contamination or injury as associated with AFNR tasks in the workplace. **CS.06.02.01.a.** Summarize how AFNR systems connect and relate on a national and global level (e.g., soil, water, economic, etc.). **CS.06.02.01.b.** Analyze differences between AFNR systems on a national and global scale. **CS.06.02.02.b.** Analyze the connections and relationships impacted when there is a change in an AFNR system on a national and global level.	
