

Colorado CTE Course – Scope and Sequence

Course Name	Intermediate Veterinary Science		Course Details	Level 3 course in the Animal Science Pathway course sequence. First of four semesters in Vet Science strand.	
			Course = 0.50 Carnegie Unit Credit		
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 education 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: Careers	3%	CS.05 Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources career pathway.	<p>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, portfolio, interviews, etc)</p> <p>CS.05.02 Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.</p>	<p>CS.05.01.01.b Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway.</p> <p>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.</p> <p>CS.05.01.03.b Assess personal goals, experiences, education, and skillset and organize the to produce the appropriate tools and develop the skills to effectively communicate about one's qualifications for an AFNR career.</p>	

				<p>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.</p>	
<p>Unit 2: The Roles of Animals in Society</p> <ul style="list-style-type: none"> • Animal Uses • Animal rights and welfare • Human Animal Bond • Companion animals vs. Production animals • Animals in research • Livestock companion animal species and breed taxonomy and identification 	22%	<p>AS.01 Analyze historic and current trends impacting the animal systems industry.</p> <p>AS.02 Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.</p>	<p>AS.01.01 Evaluate the development and implications of animal origin, domestication, and distribution on production practices and the environment. <i>SCIENCE: SC.HS.2.11</i></p> <p>AS.02.01 Demonstrate management techniques that ensure animal welfare. <i>SCIENCE: NGSS.HS.ETS1.2</i></p>	<p>AS.01.01.01.a Identify and summarize the origin, significance, distribution, and domestication of different animal specifics.</p> <p>AS.01.01.01.b Evaluate and describe characteristics of animals that developed in response to the animal environment and led to their domestication.</p> <p>AS.01.01.01.c Evaluate the implication of animal adaptations on production practices and then environment.</p> <p>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.</p> <p>AS.02.01.01.a Explain the implication of animal welfare and animal rights for animal systems.</p> <p>AS.02.01.01.c Implement and evaluate quality assurance programs and procedures for animal production.</p>	

		<p>AS.06 Classify, evaluate, and select animals based on anatomical and physiological characteristics.</p>	<p>AS.06.01 Classify animals according to taxonomic classification systems and use (e.g. agricultural companion. Etc).</p>	<p>AS.02.01.02.a Distinguish between animal husbandry practices that promote animal welfare and those that do not.</p> <p>AS.06.01.02.a Compare and contrast major uses of different animal species (e.g. agricultural, companion, etc)</p> <p>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.</p> <p>AS.06.03.03.a Research and summarize the use of products and by-products derived from animals.</p>	
<p>Unit 3: Veterinary Business Management</p> <ul style="list-style-type: none"> • Animal Care Career Opportunities • Personal Safety and Hazards • Medical Records • Veterinary Law & Ethics • Common Veterinary 	35%	<p>CS.05 Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources career pathways</p> <p>AS.01 Analyze historic and current trends impacting the animal systems industry.</p>	<p>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)</p> <p>AS.01.02 Assess and select animal production methods for use in animal</p>	<p>CS.05.01.01.b Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway.</p> <p>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)</p> <p>CS.05.01.02.b Analyze personal skillset and create a plan for obtaining the required education, training, and</p>	<p>Veterinary science CDE Livestock Evaluation CDE Prepared Public Speaking LDE Employment Skills CDE</p>

<p>Medical Equipment</p> <ul style="list-style-type: none"> Veterinary Medical Terms & Terminology 		<p>AS.02 Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.</p>	<p>systems based upon their effectiveness and impacts.</p> <p>AS.02.01 Demonstrate management techniques that ensure animal welfare.</p> <p><u>SCIENCE:</u> <u>NGSS.HS.ETS1.2</u></p>	<p>experiences to obtain a career in an AFNR pathway.</p> <p>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)</p> <p>AS.01.02.01.c Evaluate the effectiveness of different production methods and defend the use of selected methods using data and evidence.</p> <p>AS.01.02.01.c 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)</p> <p>AS.02.01.01.a Explain the implications of animal welfare and animal rights for animal systems.</p> <p>AS.02.01.02.b Analyze and document animal welfare procedures used to ensure safety and maintain low stress when moving and restraining animals.</p> <p>AS.02.01.02.c Devise, implement, and evaluate safety procedures and plans</p>	
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Course Name	Intermediate Veterinary Science - B		Course Details	Level 3 course in the Animal Science pathway course sequence. Second of four semesters in Vet science strand.	
			Course = 0.50 Carnegie Unit Credit		
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 and laboratory and field experience 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
Unit 1: Anatomy and Physiology <ul style="list-style-type: none"> External anatomy of companion animals External anatomy of livestock Organ systems Nutrition Reproduction and genetics 	35%	<p>AS.02 Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.</p> <p>AS.03 Design and provide proper animal nutrition to achieve desired outcomes for performance, development, reproduction, and/or economic production.</p>	<p>AS.02.01 Demonstrate management techniques that ensure animal welfare. <i>SCIENCE: NGSS.HS.ETS1.2</i></p> <p>ABS.03.01 Analyze the nutritional needs of animals.</p>	<p>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)</p> <p>AS.03.01.01.a Identify and summarize essential nutrients required for animal health and analyze each nutrients role in growth and performance.</p> <p>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)</p> <p>AS.03.01.01.c Assess</p>	Veterinary Science CDE

			<p>AS.03.02 Analyze feed rations and assess if they meet the nutritional needs of animals.</p>	<p>nutritional needs for an individual animal based on its growth stage and production system.</p> <p>AS.03.01.02.a Differentiate between nutritional needs of animal species.</p> <p>AS.03.01.02.b Correlate a species' nutritional needs to feedstuffs that could meet those needs</p> <p>AS.03.02.01.a Compare and contrast common types of feedstuffs by evaluating their general quality and condition.</p> <p>AS.03.02.01.b Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.</p> <p>AS.03.02.01.c Select appropriate feedstuffs for animals based on a variety of factors (e.g. economics, digestive system, and nutritional needs)</p> <p>AS.03.02.02.a Examine the importance of a balanced ration for animals based on the animals growth stage (e.g. maintenance, newborn, gestation, lactation, etc)</p> <p>AS.03.02.02.b Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and</p>	
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		<p>AS.04 Apply principles of animal reproduction to achieve desired outcomes for performance, development, and/or economic production.</p>	<p>AS.03.03 Utilize industry tools to make animal nutrition decisions.</p> <p>AS.04.02 Apply scientific principles to select and care for breeding animals <i>SCIENCE: SC.HS.2.9 SC.HS.2.8</i></p>	<p>performance.</p> <p>AS.03.03.01.a Identify and categorize tools and equipment used to meet animal nutrition needs and ensure an abundant and safe food supply.</p> <p>AS.03.03.02.a Examine and summarize the meaning of various components of feed labels and feeding directions.</p> <p>AS.03.03.02.b Analyze and apply information from a feed label and feeding directions to feed animals.</p> <p>AS.04.02.01.a Summarize genetic inheritance in animals.</p> <p>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)</p> <p>AS.04.02.02.b Demonstrate how to determine probability trait inheritance in animals.</p> <p>AS.04.02.02.c Select and evaluate breeding animals and determine the probability of a given trait in their offspring.</p> <p>AS.04.02.03.a Identify and summarize genetic defects that affect animal performance.</p>	
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		<p>AS.06 Classify, evaluate, and select animals based on anatomical and physiological characteristics.</p> <p>AS.07 Apply principles of effective animal health care.</p>	<p>AS.06.02 Apply principles of comparative anatomy and physiology to uses within various animal systems. <i>SCIENCE: SC.HS.2.1 SC.HS.2.2</i></p> <p>AS.07.01 Design programs to prevent animal diseases, parasites, and other disorders to ensure animal welfare. <i>MATH: MA.HS.N.Q.A</i></p>	<p>AS.06.02.03.a Identify and summarize the properties, locations, functions, and types of animal cells, tissues, organs, and body systems</p> <p>AS.06.02.03.b Compare and contrast animal cells, tissues, organs, body systems types, and functions among animal species.</p> <p>AS.07.01.01.a Identify and summarize specific tools and technology used in animal health management.</p> <p>AS.07.01.01.b Describe and demonstrate the proper use and function of specific tools and technology related to animal health management.</p> <p>AS.07.01.01.c Select and use tools and technology to meet specific animal health management goals.</p> <p>AS.07.01.05.a Explain the clinic significance of common veterinary methods and treatment (e.g. aseptic techniques, antibiotic use, wound management, etc)</p>	
<p>Unit 2: Biosecurity</p> <ul style="list-style-type: none"> Disease causing organisms Biosecurity, pathogen control, human and 	25%	<p>CS.02 Evaluate the nature and scope of the Agriculture, Food, and Natural Resources Career Cluster and the role agriculture, food, and natural resources in society and the economy.</p>	<p>CS.02.01 Research and use geographic and economic data to solve problems in AFNR systems.</p>	<p>CS.02.01.02.b Analyze and interpret a set of economic data and explain how it impacts an AFNR system.</p> <p>CS.02.02.02.a Define and summarize societies on local,</p>	<p>Veterinary Science CDE Prepared Public Speaking LDE</p>

<p>animal risks associated with it.</p> <ul style="list-style-type: none"> • Impacts on biosecurity 		<p>CS.03 Examine and summarize the importance of health, safety, and environmental management systems in AFNR workplaces.</p>	<p>CS.02.02 Examine the components of the AFNR systems and assess their impact on the local, state, national, and global security and economy.</p> <p>CS.03.01 Identify and explain the implication of required regulations to maintain and improve safety, health, and environmental management systems.</p> <p>CS.03.02 Develop and implement a plan to maintain and improve health, safety, and environmental compliance and performance.</p>	<p>state, national, and global levels and describe how they related to AFNR systems.</p> <p>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.</p> <p>CS.02.02.02.c Evaluate how society traditions, customs, or policies have resulted from practices with AFNR systems.</p> <p>CS.02.02.03.a Examine and summarize the components of the agricultural economy (e.g. environmental, crops, livestock, etc)</p> <p>CS.02.02.03.b Assess the economic impact of an AFNR system on a local, state, national and global level.</p> <p>CS.03.01.02.a Summarize the importance of safety, health, and environmental management in the workplace.</p> <p>CS.03.02.01.a Research and identify components require in health and safety performance plans.</p> <p>CS.03.02.01.b Analyze the effectiveness of health and safety performance plans of an AFNR workplace.</p>	
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		<p>CS.06 Analyze the interaction among AFNR systems in the production, processing, and management of food, fiber, and fuel and the sustainable uses of natural resources.</p>	<p>CS.03.03 Apply health and safety practices to AFNR workplaces.</p> <p>CS.06.02 Analyze and explain the connection and relationships between different AFNR systems on a national and global level.</p>	<p>CS.03.02.02.a Examine and categorize examples of environmental compliance plans from AFNR workplace.</p> <p>CS.03.02.02.b Develop plans to improve environmental compliance and performance within an AFNR system.</p> <p>CS.03.03.04.a Examine and categorize the risk level of contamination or injury as associated with AFNR tasks in the workplace.</p> <p>CS.06.02.01.a Summarize how AFNR systems connect and relation on a national and global level. (e.g. soil, water, economic, etc)</p> <p>CS.06.02.01.b Analyze difference between AFNR systems on a national and global scale.</p> <p>CS.06.02.02.b Analyze the connections and relationships impacted when there is a change in an AFNR system on a national or global level</p>	
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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.
- SC.HS.2.8 – The characteristics of one generation are dependent upon the genetic information inherited from previous generations.
- SC.HS.2.9 – Variation between individuals result from genetic and environmental factors.
- SC.HS.2.11 – Genetic variation among organisms affect survival and reproduction.
- 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:

- Data Literacy: the ability to identify, collect, evaluate, analyze, interpret, present, and protect data.

