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 Animal Production A**		**Course Details** **Course = 0.50 Carnegie Unit Credit**	Level 4 course in the Animal Science Pathway. This is the third semester of content in the animal production strand.	
Course Description	Students will focus on the care, maintenance, and management of livestock and companion animal species. Advanced techniques in animal behaviors and handling, routine administration and surgical procedures, governmental regulations and programs, animal identification protocols and procedures, HACCP analysis and monitoring, and facilities equipment for large, small, and exotic/alternative animal production will be developed. Current animal agricultural issues will be research 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 required.				
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 #	18103	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: Farm to Table- · Animal Supply, supply chains, sustainability,	10%	**CS.02.** 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.02.02.** Examine the components of the AFNR systems and assess their impact on the local, state, national and global society and economy.	**CS.02.02.01.a.** Identify and summarize the components within AFNR systems (e.g., Animal Systems: health, nutrition, genetics, etc.; Natural Resources Systems: soil, water, etc.). **CS.02.02.01.b.** Assess components within AFNR systems and analyze relationships between systems. **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.	
Unit 2: Genetics, DNA and Heritability · Meiosis and Mitosis · Chromosomes and DNA sequencing · Genetic Mutations and Disorders · Dominant and Recessive genes · Heritability and genetic variation	25%	**AS.04.** Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production.	**AS.04.02.** Apply scientific principles to select and care for breeding animals. *MATH: MA.HS.S.MD.A* *SCIENCE: SC.HS.2.9* *SC.HS.2.8*	**AS.04.02.01.a.** Summarize genetic inheritance in animals. **AS.04.02.02.b** Demonstrate how to determine probability trait 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.04.02.03.a.** Identify and summarize genetic defects that affect animal performance	
Unit 3: Animal Health · Healthy vs. Unhealthy characteristics · Common diseases and disease causing agents · Disease classification	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.07.01.02.a.** Explain methods of determining animal health and disorders. **AS.07.01.02.b.** Perform simple health-check evaluations on	-Vet Science CDE

· Parasites · Zoonotic diseases Vaccines and Antibiotics · Herd Health Plan			**AS.07.02.** Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national, and global level.	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.07.01.03.b.** Identify and describe common illnesses and disorders of animals based on symptoms and problems caused by wounds, diseases, parasites and physiological disorders. **AS.07.01.03.c.** Treat common diseases, parasites and physiological disorders of animals according to directions prescribed by an animal health professional. **AS.07.01.04.c.** Design and implement a health maintenance and a disease and disorder prevention plan for animals in their natural and/or confined environments. **AS.07.02.01.a.** Summarize the importance of biosecurity to the animal industry at multiple levels (e.g., local, state, national, global). **AS.07.02.02.a.** Identify and describe zoonotic diseases including their historical significance and potential future implications.	

Course Name	Advanced Animal Production B		Course Details **Course = 0.50 Carnegie Unit Credit**	Level 4 course in the Animal Science Pathway. This is the final semester of content in the animal production strand.	
Course Description	Students will focus on the care, maintenance, and management of livestock and companion animal species. Advanced techniques in animal behaviors and handling, routine administration and surgical procedures, governmental regulations and programs, animal identification protocols and procedures, HACCP analysis and monitoring, and facilities equipment for large, small, and exotic/alternative animal production will be developed. Current animal agricultural issues will be research 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 required.				
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 #	18103	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: Meat Science · Quality and Yield Grading · Indicators · Primal and Sub Primal Cuts ID · Retail cut ID · Retail cut cookery methods	25%	**FFPS.10** Meat Science	**FPPS.10.01** Apply principles of carcass evaluation.	**FPPS.10.01.a** Use visual appraisal to predict the quality and yield grade of a carcass. **FFPS.10.01.b** Define measurement tools to predict the quality and yield grade of carcass. **FPPS.10.01.c** Use measurement tools to predict the quality and yield grade of a carcass. **FPPS.10.01.d** Predict carcass	Meat Evaluation CDE

				quality based on live animal evaluation and husbandry practices.	
			FPPS.10.02 Determine yield grade and impact of product value.	**FPPS.10.02.a** Define yield grade and calculate dressing percentages. **FPPS.10.02.b** Explain yield grade factors **FPPS.10.02.c** Evaluate carcass indicators to determine yield grade.	
			FPPS.10.03 Identify meat cuts	**FPPS.10.03.a** Identify wholesale cuts. **FPPS.10.03.b** Identify Retail Cuts **FPPS.10.03.c** Explain the importance of cut identification as it relates to animal production.	
			FPPS.10.04 Determine quality grade and impact on product value.	**FPPS.10.04.a** Define quality grade **FPPS.10.04.b** Explain quality grade factors. **FPPS.10.04.c** Evaluate carcass indicators to determine quality grade	
Unit 2: Evaluation and Selection • Evaluation and selection	25%	**AS.06** Classify, evaluate, and select animals based on anatomical and	**AS.06.03** Select and train animals for specific purposes and maximum performance	**AS.06.03.01.b** Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.	

of animals for various scenarios		physiological characteristics.	based on anatomy and physiology.	**AS.06.03.01.c** Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth, and reproduction. **AS.06.03.02.a** Evaluate an animal against its optimal anatomical and physiological characteristics. **AS.06.03.02.b** Compare and contrast procedures to sustainability and efficiently develop an animal to reach its highest performance potential with respect to its anatomical and physiological characteristics. **AS.06.03.02.c** Choose, implement, and evaluate sustainable and efficient procedures (e.g. selection, housing, nutrition, and management) to produce consistently high-quality animals that are well suited for their intended purposes. **AS.06.03.03.c** Evaluate and select animals to produce superior animal products based on industry standards.	
Unit 3: Agriculture Issues ● Students will research the	10%	**CS.01** Analyze how issues, trends, technologies, and public policies impact systems in	**CS.01.01** Research, examine, and discuss issues and trends that impact AFNR systems	**CS.01.01.01.b** Analyze and summarize AFNR issues and their impact on local, state, national, and global levels.	

various current issues facing the animal production industry.		the Agriculture, Food, and Natural Resources Career Cluster	on local, state, national, and global levels.	**CS.01.01.02.a** Research and summarize trends impacting AFNR systems. **CS.01.01.02.b** Analyze current trends in AFNR systems and predict their impact on local, state, national, and global levels.	

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

CO CTE Academic Standards Resources (Rubrics, integration strategies, etc)

CDE Colorado Academic Standards Online (Online standards lookup tool)

Standard 1: Oral Expression and Listening

Prepared Graduate 1: *Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.*

Students collaborate to evaluate livestock production systems, analyze genetic selection and animal health practices, assess meat quality, investigate current agricultural issues, and develop solutions to animal production challenges through classroom, laboratory, and field experiences.

Prepared Graduate 2: *Deliver effective oral presentations for varied audiences and varied purposes.*

Students communicate findings from research on current animal agriculture issues, explain animal production practices, discuss genetic selection and herd health strategies, and present recommendations related to livestock management and meat science.

Standard 2: Reading for All Purposes

Prepared Graduate 4: *Read a wide range of informational texts to build knowledge and to better understand the human experience.*

Students analyze scientific literature, livestock production records, genetics resources, biosecurity protocols, governmental regulations, meat grading standards, industry reports, and current agricultural issue resources to understand advanced animal production systems.

Prepared Graduate 5: *Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.*

Students develop and apply specialized vocabulary related to genetics, heredity, animal health, biosecurity, HACCP, carcass evaluation, quality and yield grading, animal selection, and livestock management to communicate effectively in animal production settings.

Standard 3: Writing and Composition

Prepared Graduate 6: *Craft arguments using techniques specific to the genre.*

Students evaluate breeding decisions, herd health programs, biosecurity measures, animal selection criteria, meat quality assessments, and current agricultural issues, defending recommendations using scientific evidence, production data, and industry standards.

Prepared Graduate 7: *Craft informational/explanatory texts using techniques specific to the genre.*

Students develop herd health plans, animal selection evaluations, meat quality analyses, genetics summaries, biosecurity plans, and reports explaining animal production systems and current issues affecting the livestock industry.

Standard 4: Research Inquiry and Design

Prepared Graduate 10: *Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.*

Students research genetics and heredity, animal health, disease prevention, biosecurity, livestock management, carcass evaluation, meat quality, animal selection, governmental regulations, and current issues affecting the animal production industry to develop evidence-based management decisions and production strategies.

***Note**: Mathematics and Science standards will be added in the future. Visit the Colorado Academic Standards page for the most current version.*