TN Department of Education | College, Career and Technical Education

Published, May 2022

Small Animal Science Technologies

Primary Career Cluster:	Agriculture, Food, & Natural Resources
Consultant:	CTE.Standards@tn.gov
Course Code(s):	C18H20
Prerequisite(s):	*Agriscience* (C18H19)
Credit:	1
Grade Level:	10
Elective Focus - Graduation Requirements:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Agriculture, Food, & Natural Resources courses.
POS Concentrator:	This course satisfies one out of two required courses to meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
Programs of Study and Sequence:	This is the second course in the *Veterinary and Animal Sciences* program of study.
Aligned Student Organization(s):	FFA: http://www.tnffa.org
Coordinating Work-Based Learning:	All Agriculture students are encouraged to participate in a Supervised Agricultural Experience (SAE) program. In addition, teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit https://www.tn.gov/content/tn/education/career-and-technical-education/work-based-learning.html
Promoted Tennessee Student Industry Credentials:	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit https://www.tn.gov/education/career-and-technical-education/student-industry-certification.html
Teacher Endorsement(s):	048, 150, 448, and 950
Required Teacher Certifications/Training:	None
Teacher Resources:	https://www.tn.gov/education/career-and-technical-education/career-clusters/cte-cluster-agriculture-food-natural-resources.html Best for All Central: https://bestforall.tnedu.gov/

Approved April 10, 2015; Amended April 15, 2016; Revised Feb. 8, 2019; Amended Nov. 2021

Course-At-A-Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career & technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals and use/produce industry specific, informational texts.

Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course. This is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management.
- Participate in FFA career and leadership events (CDE/LDE) that align with this course including Agriscience Fair, Agricultural Communications, Agricultural Issues, Dairy Evaluation & Management, Employment Skills, Extemporaneous Speaking, Horse Evaluation, Livestock Evaluation, Meats Evaluation & Technology, Parliamentary Procedure, Poultry Evaluation, Public Speaking, and Veterinary Science.

For more ideas and information, view https://tnffa.org/.

Using Work-based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-2.4 |** Invite an animal scientist to discuss the history and trends within the industry.
- **Standards 3.1-3.4 |** Tour a veterinary hospital or clinic.
- **Standards 4.1-5.2 |** In groups, virtually collaborate with animal caretakers or an animal scientist to prepare an educational presentation on how to care for specific small animals properly.
- **Standards 6.1-6.3 |** Invite an animal nutritionist to discuss the aspects of proper animal health.
- **Standards 7-1.-7.2 |** Invite an animal geneticist or breeder to discuss the role of genomics in reducing animal disease.
- **Standards 8.1-10-1 |** Invite a pet store manager, veterinarian assistant, or breed representative to present skills associated with fundamental care and health for specific breeds of animals.

Course Description

Small Animal Science Technologies is an intermediate course in animal science and care for students interested in learning more about becoming a veterinarian, vet tech, vet assistant, or pursuing a variety of scientific, health, or agriculture professions. This course covers the anatomy and physiological systems of different groups of small animals, as well as careers, leadership, and history of the industry. Upon completion of this course, proficient students will be prepared for more advanced coursework in veterinary and animal science.

Course Standards

1. **History of Domestication**

    1.1 History of Small Animal Domestication: Research the history of **small animal domestication** including defining and applying industry-specific terminology to **classify animals** in the correct taxonomy. Justify the **historical uses and roles of domesticated animals**, and compare historical processes of small animal domestication.

2. **Economic, Occupational, and Technological Implications**

    2.1 Economic Implications: Determine the general **economic impact** of the small animal industry by investigating both **home and business implications**.

    2.2 Career Exploration: Explore and compare **local and regional career opportunities** in the small animal industry. Describe the **knowledge, skills, and abilities** necessary for a diverse range of **careers in small animal sciences**.

    2.3 Financial and SAE Recordkeeping: Accurately maintain an active **recordkeeping system** and apply proper **accounting and financial records** as they relate to a small animal science **supervised agricultural experience (SAE) program or enterprise**. Demonstrate the ability to summarize business records such as individual enterprise budgets, profit and loss statements, inventory management, transportation cost, and other specific reports by completing SAE and related financial applications.

    2.4 Emerging Technologies: Examine **specific emerging technologies** that have evolved within the small animal industry (such as, but not limited to, equipment, procedures, and healthcare) and evaluate the economic and societal implications of each.

3. **Personal and Occupational Health and Safety**

    3.1 Diseases: Identify, research, and determine the significance of **zoonotic diseases** associated with small animals. Compare and contrast findings relating to a specific disease. Justify the use of different methods of **infection control** in the prevention or management of zoonotic diseases and evaluate the efficacy of existing **small animal biosecurity measures**.

3.2 Health Requirements and Regulations: Identify and summarize **laws and regulations** that pertain to small animal health and safety from state and national legislation. Describe health requirements and necessary documentation for small animal **transportation and change of ownership**.

3.3 Safety and Operational Procedures: Review common **laboratory safety procedures for tool and equipment** operation in the small animal science laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.

3.4 Personal and Animal Safety Practices: Demonstrate the ability to **follow procedures precisely**, attending to special cases or exceptions noted in appropriate materials, and apply them to the following areas:

a. Animal restraint and handling
b. Techniques for transportation
c. Appropriate use of chemicals (such as pesticide, fungicide, disinfectants)
d. Differentiate between effective methods for handling small animals and methods proven to be less effective.

4. Responsible Pet Ownership

4.1 Financial and Legal Responsibilities: Research the **benefits and responsibilities of pet ownership**, including factors to consider when choosing a pet. Compare and contrast available **sources for obtaining a pet**, identifying and summarizing **common laws governing pet ownership**, and investigating the **societal and economic issues** that may impact pet owners.

4.2 Ethical Care: Compare and contast the **characteristics of responsible pet ownership** with **ownership practices that have been shown to be negligent or inappropriate**. Explain why certain practices fail and others succeed. Discussion topics may include:

a. Training and behavior management
b. Housing, boarding, and transporting
c. Breeding
d. Feeding and nurturing
e. Management of health conditions
f. Matching of animal type/breed and owner lifestyle (including living conditions, geographic location, and number and age of family members)

5. Animal Ethics

5.1 Fundaments of Animal Rights and Welfare: Identify the **fundamental philosophies related to animal rights and animal welfare**. Compare the impact of specific persons, organizations, and legislation related to animal rights and welfare of small animals, citing specific textual evidence.

5.2 Analyzing Ethical Issues: Debate specific **issues related to animal rights and animal welfare** by forming claims and counterclaims with **specific data and evidence**. Issues may include, but are not limited to:

a. Abuse and/or neglect
b. Illegal capture and/or trade
c. Overpopulation
d. Control of populations
e. Euthanasia
f. Exhibiting and showing
g. Global issues in small animal ethics and their relation to local problems.

6. Nutrition and Digestive Systems

6.1 Digestive System Identification: Differentiate between **ruminant and non-ruminant animals**, comparing and contrasting their anatomical and physiological differences of small animals.

6.2 Nutritional Requirements: Research **nutrient requirements of small animal diets** and organize these into various nutrient groups. Interpret **feed labeling** and evaluate factors such as **life stage and activity level** to determine the nutritional needs to recommend balance rations for small animals, justifying recommendations with evidence.

6.3 Nutritional Diseases: Distinguish among the **symptoms of nutritional diseases** relevant to small animals and recommend the appropriate control procedures.

7. Genetics, Reproduction, and Genomics

7.1 Reproductive Systems: Research the **major components of male and female reproductive systems** in small animals and prepare a short narrative to distinguish the function of reproductive organs, endocrine glands, and hormones. Summarize the **physiological changes that occur during reproductive phases**, including the estrus cycle, fertilization, gestation, parturition, and lactation.

7.2 Principles of Genetics and Genomics: Explain how the **fundamental principles of genetics and genomics** apply to the study of small animals. Principles should include aspects of the concepts of inheritance, gene transfer, lineage tracing of bloodlines, mapping of traits, and mapping of diseases.

8. Fundamental Care and Health of Dogs and Cats

8.1 Domestication, Care, and Health: Synthesize research on the **historical importance of dogs and cats, noting major economic, social, and medical advances impacting domestication**. Differentiate between the defining characteristics of the common dog and

common cat breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:

a. Precisely follow effective grooming procedures and techniques to maintain healthy skin, coat, nails, eyes, and ears
b. Design appropriate facilities based on an assessment of needs
c. Identify appropriate owner/handler responses to behaviors and instincts to ensure the safety of both individual and small animal in a variety of situations
d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence
e. Calculate feed rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs
f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies
g. Research common diseases and parasites and their effects on the health of dogs and cats, and draw evidence from relevant medical literature to recommend the best prevention or control measures.

9. Fundamental Care and Health of Rabbits, Guinea Pigs, Chinchillas, and Rodents

9.1 Domestication, Care, and Health: Synthesize research on the **historical importance of rabbits, guinea pigs, chinchillas, and rodents, noting major economic, social, and medical advances** impacting domestication. Differentiate between their defining characteristics. Demonstrate conceptual understanding and technical skill in current practices of comprehensive **health care and managemen**t for the following:

a. Precisely follow effective grooming procedures and techniques to maintain healthy skin, coat, nails, eyes, and ears
b. Design appropriate facilities based on an assessment of needs
c. Identify appropriate owner/handler responses to behaviors and instincts to ensure the safety of both individual and small animal in a variety of situations
d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence
e. Calculate feed rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs
f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies
g. Research common diseases and parasites and their effects on the health of rabbits, guinea pigs, chinchillas, and rodents, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.

10. Fundamental Care and Health of Avians, Fish, Amphibians, and Reptiles

10.1 Domestication, Care, and Health: Synthesize research on the **historical importance of avians, fish, amphibians, and reptiles, noting major economic, social, and medical advances** impacting domestication. Differentiate between their defining characteristics. Demonstrate conceptual understanding and technical skill in current practices of comprehensive **health care and management** for the following:

a. Precisely follow effective grooming procedures and techniques for applicable species
b. Design appropriate facilities based on an assessment of needs
c. Identify appropriate owner/handler responses to behaviors and instincts to ensure the safety of both individual and small animal in a variety of situations
d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence
e. Calculate feed rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs
f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies
g. Research common diseases and parasites and their effects on the health of birds, fish, amphibians, and reptiles, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.

Standards Alignment Notes

References to other standards include:

- SAE: Supervised Agricultural Experience: All Agriculture students are encouraged to participate in a Supervised Agricultural Experience program to practice and demonstrate the knowledge and skills learned in their agriculture courses.
- AFNR: National Agriculture, Food, & Natural Resources (AFNR) Career Cluster Content Standards: Students engaged in activities outlined above should be able to demonstrate fluency in Standards AS at the conclusion of the course.
- P21: Partnership for 21st Century Skills Framework for 21st Century Learning
    - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.