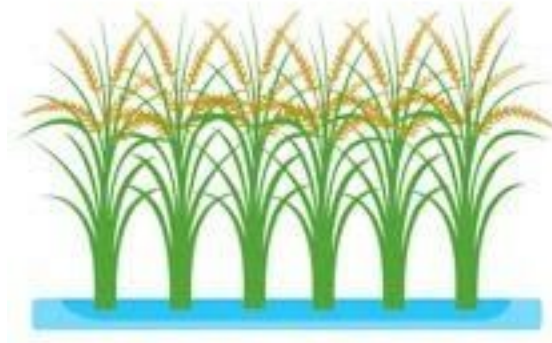


# **Agriculture, Food, and Natural Resources Pacing Guide**

Lynsey Butler and Melissa Lowery ~

Dyersburg High School

2022-2023



## Table of Contents; by Course

1. Agribusiness – State Wide Dual Credit
2. Agriscience
3. Leadership
4. Large Animal Science
5. Small Animal Science
6. Veterinary Sciences

# Agribusiness – State Wide Dual Credit A

**Course Description-** State Dual Credit-Agribusiness is an advanced course in agriculture business and study of economics within the agriculture industry. This course covers a variety of sectors and objectives listed below. Upon completion of this course, proficient students will be prepared for more advanced coursework in agriculture business and receive state dual credit.

Listed below is a tentative weekly outline of class topics of study, accompanied by the specific Tennessee Department of Education: Agriculture Standards address with each segment of study. For additional information, visit [https://www.tn.gov/content/dam/tn/education/ccte/eps/eps\\_sdc\\_ag\\_business\\_learning\\_objectives.pdf](https://www.tn.gov/content/dam/tn/education/ccte/eps/eps_sdc_ag_business_learning_objectives.pdf)

## Topics Covered

1. Different types of U.S. Agribusinesses.
2. Macro and microeconomics terms related to Agribusiness.
3. Common agribusiness organizational, budgeting, accounting, and legal structures.
4. Basic economic principles and apply them to agribusiness.
5. Management, human resources, and issues related to both areas.
6. Agriculture’s role in the American and global economic systems.
7. Current political and economic Agribusiness issues.
8. Agricultural marketing issues & develop marketing plans

**Semester A: The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities & Assessments
1	What even is Agribusiness??	<b>1. Explore different types of U.S. Agribusinesses.</b> <ul style="list-style-type: none"> <li>- Explain the meaning of Agribusiness.</li> <li>- Discuss farming and agriculture before agribusiness.</li> <li>- Describe the “big picture” of agribusiness in the US and TN.</li> <li>- Discuss different commodity types.</li> <li>- Discuss the different sectors of the Agribusiness industry.</li> <li>- Describe the service sector of the agribusiness industry.</li> </ul>	
2			

	What is the Ag Business “lingo?”	<p><b>2. Develop a comprehensive vocabulary of macro and microeconomics terms related to Agribusiness.</b></p> <ul style="list-style-type: none"> <li>- Define economics, agricultural economics, macroeconomics, microeconomics, normative and positive economics.</li> <li>- Explain <i>ceteris paribus</i> and how it is used in economics.</li> <li>- Define demand, supply, scarcity, utility, price, cost and opportunity cost.</li> </ul>	
3	Different legal structures	<p><b>3. Identify common agribusiness organizational, budgeting, accounting, and legal structures.</b></p> <ul style="list-style-type: none"> <li>- Discuss the different legal structures of business proprietorships, partnerships, and corporations.</li> <li>- Discuss the pros and cons of each legal structure.</li> <li>- Explain the characteristics of sole proprietorships and partnerships.</li> </ul>	
4	Bookkeeping vs. accounting	<p><b>3. Identify common agribusiness organizational, budgeting, accounting, and legal structures.</b></p> <ul style="list-style-type: none"> <li>- Discuss the different types of corporations.</li> <li>- Explain the characteristics of limited liability companies.</li> <li>- Differentiate bookkeeping from accounting.</li> <li>- Explain basic accounting considerations.</li> </ul>	
5	How money flows	<p><b>3. Identify common agribusiness organizational, budgeting, accounting, and legal structures.</b></p> <ul style="list-style-type: none"> <li>- Understand Operating, Cash Flow, and Capital Expenses Budgets, the components of each budget type and how each budget is utilized in agribusiness.</li> <li>- Understand the accounting equation and all components.</li> <li>- Understand the components and uses of a Balance Sheet, and Profit and Loss Statement.</li> </ul>	

6	Everything is “by the books.”	<b>3. Identify common agribusiness organizational, budgeting, accounting, and legal structures.</b> <ul style="list-style-type: none"> <li>- Analyze financial statements.</li> <li>- Discuss the importance of budgets and written goals.</li> <li>- Discuss the importance of ROIC.</li> <li>- Describe fixed and variable expenses.</li> </ul>	
7	Interest and Credit. Is it really that important?	<b>3. Identify common agribusiness organizational, budgeting, accounting, and legal structures.</b> <ul style="list-style-type: none"> <li>- Discuss the importance of credit.</li> <li>- Discuss the importance of returns, repayment ability, and risk.</li> <li>- Compute interest.</li> <li>- Understand the relationship between price competition and competitive business organization.</li> </ul>	
8	Money Matters	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> <ul style="list-style-type: none"> <li>- Understand basic concepts of economics and explain their significance.</li> <li>- Discuss the interactions of agribusiness sectors and how they are interconnected.</li> </ul>	
9	Business = Efficiency	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> <ul style="list-style-type: none"> <li>- Analyze the efficiency of production agriculture.</li> <li>- Explain how specialization is related to efficiency.</li> <li>- Discuss the basic economic questions.</li> <li>- Identify and characterize the three stages of production.</li> </ul>	
10	How to get the end product that you want (resources).	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> <ul style="list-style-type: none"> <li>- Discuss different types of resources and inputs.</li> </ul>	

		<ul style="list-style-type: none"> <li>- Explain scarcity, types of resources and desires of producers and consumers.</li> <li>- Understand market price determination, demand, demand schedules, demand curves, supply, supply and demand relationships and shifters, and equilibrium.</li> </ul>	
11	Balancing Business	<p><b>4. Comprehend basic economic principles and apply them to agribusiness.</b></p> <ul style="list-style-type: none"> <li>- Explain the production function relationship and give a working example of the production function.</li> <li>- Accurately calculate price versus cost, TP, TC, MP, MC.</li> <li>- Discuss the role of the consumers and demand with regards to the different agribusiness sectors.</li> <li>- Comprehend and apply concepts of utility, satisfaction, and equilibrium.</li> </ul>	
12	Business does come to an end!	<b>Course Review and Exam</b>	

## Agribusiness – State Wide Dual Credit B

**Course Description-** State Dual Credit-Agribusiness is an advanced course in agriculture business and study of economics within the agriculture industry. This course covers a variety of sectors and objectives listed below. Upon completion of this course, proficient students will be prepared for more advanced coursework in agriculture business and receive state dual credit.

Listed below is a tentative weekly outline of class topics of study, accompanied by the specific Tennessee Department of Education: Agriculture Standards address with each segment of study. For additional information, visit [https://www.tn.gov/content/dam/tn/education/ccte/eps/eps\\_sdc\\_ag\\_business\\_learning\\_objectives.pdf](https://www.tn.gov/content/dam/tn/education/ccte/eps/eps_sdc_ag_business_learning_objectives.pdf)

Topics Covered

1. Different types of U.S. Agribusinesses.
2. Macro and microeconomics terms related to Agribusiness.
3. Common agribusiness organizational, budgeting, accounting, and legal structures.
4. Basic economic principles and apply them to agribusiness.
5. Management, human resources, and issues related to both areas.
6. Agriculture’s role in the American and global economic systems.
7. Current political and economic Agribusiness issues.
8. Agricultural marketing issues & develop marketing plans

**Semester B: The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities & Assessment
1	Back to the Basics	<b>Review Key concepts and objectives from Trimester A</b>	
2	Let’s do the math!	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> - Comprehend and apply elasticity; be able to calculate and interpret elasticity coefficients for price, cross-price, income, elastic ties of demand, and price elasticity of supply.	
3	What are the logistics?	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> - Understand and be able to explain the Law of Demand, Law of	

		Diminishing Returns, and Supply and Demand principles. - Describe the meaning of opportunity cost and be able to apply its use to agribusiness.	
4	How to sell	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> - Explain different types of economic systems. - Define and explain markets, market structure, and economic modules. - Understand how economic models are used to describe market structure with relationship to competition.	
5	Everyone does have a role!	<b>4. Comprehend basic economic principles and apply them to agribusiness.</b> - Understand the differences in perfect competition, monopoly, oligopoly, and collusion with regards to market structure. - Understand the role of agricultural economists and how they predict market movement.	
6	Why is marketing important?	<b>8. Identify agricultural marketing issues &amp; develop marketing plans.</b> - Understand the role of marketing. - Be able to compute market potential. - Compare and contrast target marketing vs mass marketing.	
7		<b>5. Discuss management, human resources, and issues related to both areas.</b> - Discuss successful qualities of a good agribusiness manager. - Discuss the four functions of management. - Discuss the decision-making process (management process).	
8		<b>5. Discuss management, human resources, and issues related to both areas.</b>	

		<ul style="list-style-type: none"> <li>- Discuss strategic management and its importance for long term business success.</li> <li>- Explain how strategic management and planning can be used to obtain competitive advantages.</li> <li>-Discuss how to use a SWOT analysis.</li> </ul>	
9		<p><b>6. Discuss agriculture's role in the American and global economic systems.</b></p> <ul style="list-style-type: none"> <li>- Discuss the size and importance of production agriculture.</li> <li>- Explain the importance of Agribusiness and foreign trade.</li> <li>- Discuss the impact of U.S. agriculture on the global economy.</li> <li>- Understand markets and factors that affect market performance including competition.</li> </ul>	
10		<p><b>6. Discuss agriculture's role in the American and global economic systems.</b></p> <ul style="list-style-type: none"> <li>- Discuss commodity markets, trading, and futures.</li> <li>- Discuss exchange rates, trade and tariffs and their effects on commodities.</li> <li>- Discuss NAFTA.</li> </ul>	
11		<p><b>7. Discuss current political and economic Agribusiness issues.</b></p> <ul style="list-style-type: none"> <li>- Explain why agricultural policies are needed.</li> <li>- Explain the monetary and fiscal policies of the federal government as they relate to the general economy.</li> </ul>	
12	Business does come to an end!	<b>Course Review &amp; Exam</b>	



## **Agriscience A**

**Course Description-** Agriscience is an introductory laboratory science course that prepares students for biology, additional sciences, and agriculture courses both during and after high school. This course helps students understand how important the role of agriculture science and technology is in the 21<sup>st</sup> century.

Agriscience A and B is the first course for all programs of study in the agriculture, food, and natural resources high school curricula. Objectives and standards mastered in this class can be beneficial as students study biology, chemistry, physical science, environmental science and anatomy and physiology.

Listed below is a tentative weekly outline of class topics of study, accompanied by the specific Tennessee Department of Education: Agriculture Standards address with each

segment of study. For additional information, visit <https://www.tn.gov/education/career-and-technical-education/career-clusters/cte-cluster-agriculture-food-natural-resources.html>

**Semester A: The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities and Assessment
1	Introduction What is FFA?	<p><b>Agriscience Investigation and Overview</b></p> <p>1) Synthesize research on the historical importance and purpose of agriculture and agriculture organizations, identifying major events, opportunities and technological developments influenced by agriscience theories and practices.</p>	
2	What do you know about FFA?	<p><b>Agriculture and Society</b></p> <p>4) Determine how a Supervised Agricultural Experience (SAE) program functions as a method to apply concepts of the scientific investigation process (i.e. conducting an Agriscience Fair project). Compare and contrast the types of SAEs as related to their importance to the scientific investigation process.</p>	
3	Safety  Cells: the basic building blocks of life	<p><b>Agriscience Investigation and Overview</b></p> <p>2) Identify and review general common laboratory safety procedures including but not limited to prevention and control procedures in agriscience laboratories. Incorporate safety procedures and complete safety test with 100 percent accuracy.</p> <p><b>Fundamentals of Cell Biology</b></p> <p>9) Compare basic plant and animal cell biology, including structure and function. Create a visual representation that identifies cellular organelles and major cell processes.</p> <p>10) Compare and contrast the roles of proteins, carbohydrates, lipids, and nucleic acids as they relate to cell growth and cell reproduction.</p>	

4	What's in your "Genes"	<p><b>Fundamentals of Genetics and Heredity</b></p> <p>11) Determine the significance of and relationships between genes, chromosomes, proteins, and hereditary traits. Analyze the role of genes in determining genetic make-up, gender, and hereditary characteristics. Using systems of equations, explain the variation and distribution of genotypes and phenotypes expressed in plants and animals.</p>	
5	Animals system and how they work	<p><b>Fundamentals of Anatomy and Physiology</b></p> <p>12) Using graphic illustrations and supporting text, identify and describe major animal body systems (skeletal, muscular, respiratory, digestive, nervous, circulatory, respiratory, and reproductive) to establish a basic knowledge of their purpose, structure, and function.</p> <p>-Cattle &amp; swine-</p>	
6	Animals system and how they work Continued	Continuation week 5 -sheep, goats, poultry-	
7	Animals love food too!	<p><b>Chemistry of Animal Digestion</b></p> <p>13) Classify the types of digestive systems in domestic animals, and compare and contrast their anatomical and physiological differences. Synthesize research on animal nutrition (using academic journals or publications from Tennessee Extension Service) to produce an informative narrative, including defining and applying nutrition specific terminology, to examine the stages of digestion and associated processes.</p> <p>15) Research the relationship between metabolism, energy, and nutrition. Evaluate life stage and activity level to determine the nutritional needs of animals. Differentiate types of rations to maximize animal performance.</p>	
8	Animals love food too! Continued	<p><b>Chemistry of Animal Digestion</b></p> <p>14) Use the periodic table and the atomic chart to compare differences between ionic and</p>	

		covalent bonding as related to digestion. Demonstrate an understanding of the interdependence of the complex chemical and biological processes involved in the digestion process including, but not limited to, the following: elements, compounds, mixtures, and acids.	
9	Who's the momma?	<p><b>Reproductive Systems</b></p> <p>18) Research and develop illustrative models that compare and contrast the reproductive structures of plants, drawing out key differences between sexual and asexual reproduction processes.</p> <p>19) Describe the structure and function of different seed components and summarize their roles in plant reproduction and propagation.</p> <p>20) Describe the structures and functions of the male and female animal reproductive systems. Compare and contrast the differences of the reproductive systems between small and large animal species.</p>	
10	Everything needs energy to operate	<p><b>Principles of Power and Energy</b></p> <p>21) Apply fundamental principles of physics as they relate to agricultural power and technology concepts in order to demonstrate the following: a. Analyze the relationship between speed, distance, and time b. Relate the types of simple machines to the law of machines and mechanical advantages c. Specify groups, sources, and forms of energy d. Analyze the principle of heat energy and describe the way heat travels e. Explain the law of conservation of energy f. Explain the production of energy and relate it to the invisible light spectrum</p>	
11	Who turned out the lights?	<p><b>Fundamentals of Electricity</b></p> <p>22) Identify different methods by which electrical energy can be produced. Discuss the safety hazards involved in each method as well as prevention and control methods relevant to electrical power supplies. Justify the use of different precautions for the prevention or</p>	

		management of electrical hazards and evaluate the efficacy of the prevention measures. 23) Utilize the appropriate instruments needed to calculate and measure voltage, amperage, resistance, and wattage.	
12	It's almost over!	<b>Course Review and Exam</b>	

## **Agriscience B**

**Course Description-** Agriscience is an introductory laboratory science course that prepares students for biology, additional sciences, and agriculture courses both during and after high school. This course helps students understand how important the role of agriculture science and technology is in the 21<sup>st</sup> century.

Agriscience A and B is the first course for all programs of study in the agriculture, food, and natural resources high school curricula. Objectives and standards mastered in this class can be beneficial as students study biology, chemistry, physical science, environmental science and anatomy and physiology.

Listed below is a tentative weekly outline of class topics of study, accompanied by the specific Tennessee Department of Education: Agriculture Standards address with each segment of study. For additional information, visit

**Semester B: The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities & Assessment
1	How does agriculture affect society?	<p><b>Agriculture and Society</b></p> <p>3) Gather and analyze information from multiple authoritative sources, such as the United States Bureau of Labor Statistics, United States Department of Agriculture website and Tennessee labor data, to summarize the economic impact of the agricultural industry. Describe major career trends in Tennessee, the United States, and worldwide.</p> <p>5) Conduct a research project or literature review exploring a specific social and/or political impact on the agriculture industry at the local, state, national, or international level. For example, explore how the increase in availability of genetically modified organisms has impacted crop production and the green movement. Summarize findings in an informative essay. Revise, edit or rewrite as needed to strengthen writing.</p>	
2	The environment is important too!	<p><b>Fundamentals of Environmental Systems</b></p> <p>6) Describe the biogeochemical cycles impacting the agriculture industry by creating illustrative models and informative texts for the following:  a. Carbon cycle b. Nitrogen cycle c. Oxygen cycle d. Water cycle</p>	
3	More about the environment!	<p><b>Fundamentals of Environmental Systems</b></p> <p>7) Critique the dynamics of biomass and energy flow in ecosystems by analyzing the major components of a food chain. Analyze the structure of the relationships among the concepts of carrying capacity, species populations, and organism interactions</p>	

		within multiple ecosystems and natural habitats.	
4	Watch the pollution!	<p><b>Fundamentals of Environmental Systems</b></p> <p>8) Produce an informative essay to distinguish between types of pollution and their sources, defining and applying ecology- and conservation-specific terminology. Compare and contrast important connections between pollution and its effects on environmental conditions (i.e. water, soil and air), animal populations, and plant populations.</p>	
5	Let's talk plants!	<p><b>Fundamentals of Plant and Soil Science</b></p> <p>16) Apply concepts related to the basic cellular and biochemical processes in plants to demonstrate the following:</p> <p>a. Create a graphic illustration of the parts and functions of plant cells</p> <p>b. Use quantitative reasoning to balance chemical equations related to plant processes</p>	
6	More Plant Talk!	<p><b>Fundamentals of Plant and Soil Science</b></p> <p>16) Apply concepts related to the basic cellular and biochemical processes in plants to demonstrate the following:</p> <p>c. Interpret the role of physics within the cohesion-tension theory and its significance to plant life</p> <p>d. Examine the roles of photopigments and the effects of different colors of light on plant growth</p>	
7	Have to keep the plants healthy!	<p><b>Fundamentals of Plant and Soil Science</b></p> <p>17) Formulate a hypothesis about the correlation between plant nutrient deficiencies and soil composition. Conduct basic soil analysis to determine the chemical elements and nutritional levels available in soils essential for plant growth. Draw conclusions about the ability of soils to</p>	

		meet the nutritional requirements of plants.	
8	How do plants reproduce?	<p><b>Reproductive Systems</b></p> <p>18) Research and develop illustrative models that compare and contrast the reproductive structures of plants, drawing out key differences between sexual and asexual reproduction processes.</p>	
9		<p><b>Reproductive Systems</b></p> <p>19) Describe the structure and function of different seed components and summarize their roles in plant reproduction and propagation.</p>	
10	Rev those engines!	<p><b>Fundamentals of Engines</b></p> <p>24) Apply basic principles of thermodynamics to analyze the function of major components of gasoline and diesel fuel engines.</p>	
11	Keep those engines going!	<p><b>Fundamentals of Engines</b></p> <p>25) Using quantitative reasoning and employing appropriate unit conversions, calculate horsepower and thermal efficiency in internal combustion engines by creating systems of equations that describe numerical relationships.</p>	
12	It's almost over!	<b>Course review and exam</b>	



## **Organizational Leadership**

**Course description-** *Organizational Leadership and Communications* is an applied-knowledge course for students interested in learning more about the attributes and skills of successful leaders in the agriculture industry. This course covers organizational behavior, communication, management, and leadership topics. Students participate in activities that will assist them in the development of communication and interpersonal skills transferrable to any agribusiness application.

Upon completion of this course, proficient students will be prepared for the level-four Agricultural Business and Finance course and advanced study at a postsecondary institution. Standards in this course are aligned with Tennessee State Standards for English Language Arts & Literacy in Technical Subjects as well as National Agriculture, Food, & Natural Resources Career Cluster Content Standards. For more information on the benefits and requirements of implementing this program in full, please visit the Agriculture, Food, & Natural Resources website at <https://www.tn.gov/education/career-and-technical-education/careerclusters/cte-cluster-agriculture-food-natural-resources.html>.

**The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standard	Instructional Activities & Assessment
1	Introduction-The role of Cooperation and Communication	<p><b>Communication</b></p> <p>8) Practice effective verbal and nonverbal communication for use in business environments via role-plays. Contrast communication appropriate for an agribusiness environment versus an informal setting.</p> <p>9) Recognize the consequences of poor communication skills and describe the importance of effective communication among team members. Apply concepts of giving and receiving oral and written instructions to accomplish a complex task.</p>	
2	Week 1 Continued	<p><b>Communication</b></p> <p>10) Define constructive criticism; analyze potential conflicts involved in giving and receiving feedback; and create a plan for engaging in productive dialogue. Role-play work-related feedback as an employer and as an employee. Demonstrate active listening and appropriate response skills.</p> <p>11) Cite evidence to support the idea that conflict is a normal part of work relationships. Compare and contrast assertive and aggressive communication in conflicts. Apply concepts pertaining to different methods for handling conflicts by participating in role-play exercises and constructively critiquing the practices of others.</p>	
3	What am I going to be when I grow up?	<p><b>Career Awareness</b></p> <p>1) Use local news media, organizational websites, and real-time labor market information to investigate occupations in business leadership and communications. Compare and contrast the knowledge, skills, and abilities necessary for employment, as well as the typical level of education required.</p> <p>2) Demonstrate the ability to prepare basic personal and business records to</p>	

		complete taxes, employment, and SAE related applications, including resume, budgets, income statements, balance sheets, cash flow statements, profit and loss statements, and equity statements.	
4	Let's get organized!	<p><b>Organizational Structure and Performance</b></p> <p>4) Define organizational behavior, citing examples from agricultural businesses currently in operation. Produce a narrative or annotated timeline analyzing the major developments and features of the agriculture industry that have influenced changes in organizational behavior over the past century. These features include but are not limited to: scientific advancements, transportation of goods, labor market shifts, labor organization, the rise of large corporations, subsidies, automation, information technology, and globalization.</p> <p>5) Compare and contrast characteristics of models of organizational change. Analyze a case study in which an organization faced an unplanned change and develop a written argument supporting transformational change as a preventive measure.</p>	
5	You've got to be consistent!	<p><b>Organizational Structure and Performance</b></p> <p>6) Differentiate between extrinsic and intrinsic motivation and summarize how each influences employee productivity. Develop a list of strategies for motivating individuals or groups and write business scenarios in which the strategies apply.</p> <p>7) Create an annotated graphic (such as a flowchart, table, or mind map) illustrating the stages of team development. Draw conclusions about the advantages and disadvantages of group decision-making and evaluate the potential effectiveness of group decision-making at each stage.</p>	
6	Our sphere of influence	<b>Innovation and Influence</b>	

		<p>20) Analyze case studies of stakeholder resistance to change, identify the causes, and propose measures for overcoming resistance.</p> <p>21) Compare and contrast theories of persuasion and influence (reciprocity, commitment, social proof, liking, authority, scarcity) and apply these theories to agricultural sales and marketing communications.</p> <p>22) Synthesize the understanding of stakeholder resistance, adoption models, and persuasion theories. Develop a sales plan for a new agricultural product or service (such as commodity trading to farmers). Deliver a focused, coherent presentation on the plan.</p>	
7	It's a management thing!	<p><b>Management and Leadership</b></p> <p>15) Define organizational culture and evaluate the role of business leaders in establishing and maintaining a workplace in which employees work cooperatively with others from diverse backgrounds.</p> <p>16) Research a variety of project management models and create a visual representation to show important connections and distinctions between the essential phases of each model. Select one model and modify it to meet the needs of a sample organization; justify its application in an agribusiness setting.</p> <p>17) Research professional ethical standards from recognized national organizations (such as the United States Department of Agriculture – Rural Business Cooperative Service). Synthesize principles from the standards to create a personal code of agribusiness ethics designed to address professional, ethical, and legal issues such as: a. Conducting business with friends, relatives, or competitors b. Sales incentives c. Pricing policies d. Illegal practices e. Behavior toward customers, employees, and shareholders</p>	
8	Use your traits and skills	<b>Management and Leadership</b>	

		<p>13) Develop a hypothesis surrounding the character traits and interpersonal skills needed by effective agribusiness managers. Determine which individual traits and skills can be developed and create a plan for personal growth. Example traits and skills include but are not limited to: enthusiasm, effective communication, decision making, risk evaluation, self discipline, integrity, lifelong learning, and teamwork.</p> <p>14) Analyze the outcomes of case studies or current events and critique how organizational leaders managed people and made decisions. Write a narrative advocating alternative management strategies that would benefit the organization and which lead to either a better financial outcome or improved employee motivation.</p>	
9	Opposites attract	<p><b>Organizational Structure and Performance</b></p> <p>3) Consult case studies, business journals, and news articles to determine the relationships between organizational performance and human capital, social capital, organizational learning, total quality management, and customer satisfaction. Analyze case studies to identify the elements supporting high-performing organizations and describe how successful agribusinesses incorporate them.</p> <p><b>Communication</b></p> <p>12) Analyze the potential customer impact of sample verbal, print, and electronic communications in agribusiness. Examine case studies in which various forms of communication have facilitated or hampered effective business operations.</p>	
10	Parliamentary Law = Life	<p><b>Management and Leadership</b></p> <p>18) Demonstrate knowledge of basic parliamentary procedures by planning and conducting a simulated annual or monthly stockholders meeting for a small agricultural corporation or cooperative. Develop an agenda and</p>	

		take official minutes. Identify meeting materials to be used, including data and reports, and outline the responsibilities of organizational leadership in facilitating the meeting.	
11	There is always an influence!	<p><b>Innovation and Influence</b></p> <p>19) Formulate a hypothesis about the relationship between the stages of innovation adoption (knowledge, persuasion, decision, implementation, confirmation) and the rate of innovation adoption (innovator, early adopter, early majority, late majority, laggard). Analyze the role that opinion leaders play in the adoption process. Write coherent arguments based on evidence from real-world examples to support the hypothesis.</p>	
12	That's a wrap!	Review and course exam	

## Large Animal Science

**Course description-** Large Animal Science is an applied course in veterinary and animal science 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 anatomy and physiological systems of different groups of large animals, as well as careers, leadership, and history of the industry. Upon completion of this course, proficient students will be prepared for success in the level-four Veterinary Science course and further postsecondary training

Listed below is a tentative weekly outline of class topics of study, accompanied by the specific Tennessee Department of Education: Agriculture Standards address with each segment of study. For additional information, visit [https://www.tn.gov/content/dam/tn/education/ccte/cte/cte\\_std\\_large\\_animal\\_science.pdf](https://www.tn.gov/content/dam/tn/education/ccte/cte/cte_std_large_animal_science.pdf)

**The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities & Assessments
1	Safety First!	<b>Personal and Occupational Health and Safety</b>	

	<p>OSHA Certification</p>	<p>8) Review common laboratory safety procedures for tool and equipment operation in the large animal 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.</p> <p>9) Demonstrate in a live setting or in a presentation 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 large animals and methods proven to be less effective.</p> <p>OSHA Certification</p>	
2	<p>Safety Continued OSHA Certification continued if necessary.</p>	<p><b>Personal and Occupational Health and Safety</b></p> <p>6) Identify, research, and determine the significance of zoonotic diseases associated with large animals. Compare and contrast findings from multiple credible sources relating to a specific disease (including student's own experience or laboratory experiment, case studies, and scholarly journals). Justify the use of different methods of infection control in the prevention or Page 3 management of a zoonotic disease and evaluate the efficacy of existing large animal biosecurity measures.</p> <p>7) Correctly identify and summarize laws and regulations that pertain to large animal health and safety in an explanatory text, citing specific textual evidence from state and national legislation. Describe health requirements and necessary documentation for large animal transportation and change of ownership.</p>	
3	<p>What's the history?</p>	<p><b>History of Domestication</b></p> <p>1) Synthesize research on the history of large animal domestication to produce an informative essay, including defining and applying industry-specific terminology to classify animals in the correct taxonomy. Justify the historical uses and roles of</p>	

		domesticated animals, and compare historical processes of large animal domestication.	
4	Careers in the Large Animal Industry.	<p><b>Economic, Occupational and Technological Implications</b></p> <p>2) Determine the general economic impact of the large animal industry by investigating both recreational and business implications of large animal domestication through governmental and news publications. Develop a summary including both graphical representations and descriptive text to summarize findings.</p> <p>3) Explore and compare local and regional career opportunities in the large animal industry and evaluate labor data to predict the employment outlook. Describe in a written or visual representation the knowledge, skills, and abilities necessary for a diverse range of careers in large animal sciences citing specific textual evidence from local job postings and Tennessee labor data.</p>	
5	Who knew animals have an economical impact?	<p><b>Economic, Occupational and Technological Implications</b></p> <p>4) Accurately maintain an activity recordkeeping system and apply proper financial recordkeeping skills as they relate to a large animal science supervised agricultural experience (SAE) program. Demonstrate the ability to summarize records and reports by completing SAE and related applications.</p> <p>5) Examine specific technologies that have evolved within the large animal industry (such as, but not limited to equipment, housing, procedures, and healthcare) and evaluate the economic and societal implications of each.</p>	
6		<p><b>Animal Ethics</b></p> <p>10) 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 large animals.</p> <p>11) Investigate current large animal issues by analyzing an author's purpose and assessing the extent to which the reasoning and evidence in a specific text support the author's claim. Debate specific issues by forming and supporting claims and counterclaims with specific data and evidence. Issues related to animal rights and animal welfare may include, but are not limited to: a. Abuse and/or neglect</p>	



		<p>b. Environmental implications  c. Consumer product implications  d. Exhibiting and showing  e. Global issues in large animal ethics and their relation to local problems</p>	
7		<p><b>Nutrition and Digestive Systems</b> 12)  Create a visual representation to differentiate between ruminant and non-ruminant animals and monogastric and polygastric animals, comparing and contrasting their anatomical and physiological differences. Explain the relationships of digestive system types to the ability of an animal to digest and absorb different classes of feed.</p> <p>13) Using information from scholarly journals or Tennessee Extension Service, research nutrient requirements of the diets of large animals and organize these into various nutrient groups. Differentiate between roughages and concentrates and their nutritional values.</p> <p>14) Interpret feed labeling and evaluate factors such as life stage and activity level to determine the nutritional needs and then recommend balance rations for each large animal species, justifying recommendations with evidence from the text.</p> <p>15) Diagnose the symptoms of nutritional diseases relevant to large animals and recommend the appropriate control procedures, citing specific evidence to support recommendations.</p>	
8		<p><b>Genetics and Reproduction</b></p> <p>16) Research and develop illustrative models of the major components of male and female reproductive systems in large animals and prepare a short narrative to distinguish the function of reproductive organs, endocrine glands, and hormones. Produce an explanatory essay comparing the physiological changes that occur across different species during reproductive phases, including the estrus cycle, fertilization, gestation, parturition and lactation.</p> <p>17) Using graphical representations and descriptive text, explain how the roles of heritability, selection intensity, generation interval, and other advanced principles of genetics (such as DNA testing for disorders) apply to predict gene and trait transfer in large animal species. Principles include but are not limited to: a. Economically important traits in</p>	

		production animals (i.e. artificial reproduction methods) b. Interpretation and utilization of animal performance records (i.e. Expected Progeny Difference [EPD]) c. Hybrid vigor	
9		<p><b>Fundamental Care and Health of Horses</b></p> <p>18) Synthesize research on the historical importance of horses, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that formulates comparisons among different horse breeds and hybrids. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:</p> <p>a. Design appropriate facilities based on assessment of needs and present plans in a visual format</p> <p>b. Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations</p> <p>c. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence</p> <p>d. Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships</p> <p>e. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies</p> <p>Page 5</p> <p>f. Research common diseases and parasites and their effects on the health of horses, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.</p>	
10		<p><b>Fundamental Care and Health of Cattle</b></p> <p>19) Synthesize research on the historical importance of cattle, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that formulates comparisons among different cattle breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:</p>	

		<p>a. Design appropriate facilities based on assessment of needs and present plans in a visual format</p> <p>b. Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations</p> <p>c. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence</p> <p>d. Using quantitative reasoning and appropriate units, calculate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships</p> <p>e. Illustrate the reproductive cycle graphically, summarize available breeding method, and current reproductive technologies</p> <p>f. Research common diseases and parasites and their effects on the health of cattle, and draw evidence from the most recent medical literature to recommend the best prevention or control measures</p> <p>g. Evaluate the economic implications of livestock management practices (such as dehorning)</p> <p><b>Fundamental Care and Health of Swine</b></p> <p>21) Synthesize research on the historical importance of swine, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that formulates comparisons among different swine breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:</p> <p>a. Design appropriate facilities based on assessment of needs and present plans in a visual format</p> <p>b. Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations</p> <p>c. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence</p> <p>d. Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships</p> <p>e. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies</p> <p>f. Research common diseases and parasites and</p>	
--	--	---	--

		<p>their effects on the health of swine, and draw evidence from the most recent medical literature to recommend the best prevention or control measures</p>	
11		<p><b>Fundamental Care and Health of Sheep and Goats</b></p> <p>20) Synthesize research on the historical importance of sheep and goats, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that formulates comparisons among different sheep and goat breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following: a. Design appropriate facilities based on assessment of needs and present plans in a visual format b. Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations c. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence d. Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships e. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies</p> <p><b>Fundamental Care and Health of Poultry</b></p> <p>22) Synthesize research on the historical importance of poultry, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that formulates comparisons among different poultry breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following: a. Design appropriate facilities based on assessment of needs and present plans in a visual format b. Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and bird in a variety of situations c. Distinguish between clinical signs of proper health and poor health, justifying explanations</p>	

		with data and evidence d. Using quantitative reasoning and appropriate units, calculate appropriate rations based on bird characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships e. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies f. Research common diseases and parasites and their effects on the health of poultry, and draw evidence from the most recent medical literature to recommend the best prevention or control measures	
12	It's almost over!	Review and Final Exam`	

## Veterinary Sciences

**Course Description-** Veterinary Science is an advanced 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 principles of health and disease, basic animal care and nursing, clinical and laboratory procedures, and additional industry-related career and leadership knowledge and skills. Upon completion of this course, students will be able to pursue advanced study of veterinary science at a postsecondary institution.

**Program of Study Application-** This is the fourth and final course in Veterinary and Animal Sciences program of study. For more information on the benefits and requirements of implementing this program in full, please visit the Agriculture, Food, & Natural Resources

[https://www.tn.gov/content/dam/tn/education/ccte/cte/cte\\_std\\_vet\\_science.pdf](https://www.tn.gov/content/dam/tn/education/ccte/cte/cte_std_vet_science.pdf)

**The following Objectives/Standards and Units will be covered:**

Week	Topic	Accompanying Standards	Instructional Activities & Assessment
1	Safety first, always!	<b>Personal and Occupational Health and Safety</b> 3) Compare and contrast the safety hazards associated with clinical and field settings. Review safety hazard case studies	

		<p>and recommend research-based practices to prevent the safety hazard in the future.</p> <p>4) Review common laboratory safety procedures for tool and equipment operation in the veterinary 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.</p> <p>5) Demonstrate in a live setting or in a presentation the ability to follow procedures precisely for the following areas: a. Animal restraint and handling in clinical or field settings b. Sanitation, disinfection, and sterilization procedures to prevent transfer of zoonotic diseases c. Material safety data sheets (MSDS) interpretation</p>	
<b>2</b>	What's out there?	<p><b>Economic, Occupational, and Technological Implications</b></p> <p>1) Explore and compare local and regional career opportunities in the veterinary science industry using information from local job postings and Tennessee labor data. Describe in a written or visual representation the knowledge, skills, and abilities necessary for a selected occupation in veterinary science.</p> <p>2) Examine specific technologies that have evolved within the veterinary science industry including but not limited to advances in equipment, procedures, and healthcare, and evaluate the economic and societal implications of each. Explain in an informative essay how these advances have impacted the veterinary science industry</p>	
<b>3</b>	It's all about the anatomy.	<p><b>Clinical Anatomy and Physiology</b></p> <p>8) Identify common clinical terminology, abbreviations, and symbols relating to the diagnosis, pathology, and treatment of animals.</p> <p>9) Recognize various states of cellular homeostasis to identify infections, diseases, and mutations.</p> <p>10) Review fundamental concepts pertaining to tissue and organ systems by comparing and contrasting the structure and function of different tissue types, including epithelial, connective, muscle, and nervous</p>	

		<p>tissues. Summarize in written or presentation format how cellular differentiation allows for specialized tissue development.</p> <p>11) Identify and research the major body systems, including skeletal, muscular, respiratory, digestive, nervous, integumentary, urinary, and reproductive system. Develop models to compare and contrast between different species of small and large domesticated animals.</p>	
4	What's law goes!	<p><b>Veterinary Law and Ethics</b></p> <p>6) Gather and compare information from a variety of authoritative sources (such as professional associations or non-profit organizations) on the philosophical, social, moral, and ethical issues encountered in the veterinary profession. Debate their implications for practitioners of veterinary science by developing claim(s) and counterclaim(s) supported by reasoning and evidence from research.</p> <p>7) Citing specific textual evidence from legislation and news media, summarize local, state, and federal laws that regulate policies and procedures in veterinary medicine pertaining to: a. Animal rights and welfare b. Professional licensing c. Liability of veterinary staff d. U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and U.S. Environmental Protection Agency (EPA) regulations for veterinary drugs and biologicals e. Occupational Safety and Health Administration (OSHA) regulations for workplace safety</p>	
5	Nutrition is the most important!	<p><b>Clinical Nutrition</b></p> <p>12) Perform nutritional assessment techniques, including body condition scoring and life stage to determine the nutritional status of animals. Apply this information to recommend balanced rations, providing written and oral justification to support recommendations.</p> <p>13) Research the relationships of diseases and disorders to digestion, absorption, and metabolic processes using case studies, instructional materials, and scholarly</p>	

		journals. Assess the impact of various diseases and disorders on the maintenance of optimum nutrition levels in the body.	
6	Lets put it to practice!	<p><b>Clinical Procedures</b></p> <p>14) Correctly identify and describe the function of common equipment used in the clinical area of a veterinary practice, including but not limited to examination tools, radiology equipment, ultrasound equipment, surgical equipment and testing equipment. Develop a checklist including safe use and maintenance for specific equipment.</p> <p>15) Demonstrate, in a live setting or in a presentation, physical examination procedures in the following areas: a. Identification of exam purpose, importance, and routine tasks b. Completion of new client health history report c. Identification and evaluation of factors affecting the physiological state of animals d. Identification of characteristics and signs of healthy animals e. Demonstration of procedures to accurately obtain and record vital signs f. Identification and evaluation of effects of age, stress, and environmental factors on vital signs.</p>	
7	Real world = Real experience	<p><b>Clinical Procedures</b></p> <p>16) Identify and recommend the optimum timeline for administering different types of vaccines suitable for different species. Demonstrate, in a live setting or in a presentation, the ability to: a. Identify injection methods b. Identify appropriate anatomical injection sites c. Administer the injection, including the selection of appropriate equipment</p> <p>17) Explain the importance of contamination prevention as related to the veterinary industry. Demonstrate, in a live setting or in a presentation, the ability to explain and follow contamination control procedures relating to the following areas: a. Principles of sanitation, disinfection, antiseptics, and sterilization b. Exam room care and sanitation procedures c. Classification of sterilants, antiseptics, disinfectants, and their appropriate applications d. Hazardous waste</p>	
8			



		management e. Proper techniques to fill a syringe for a prescribed dosage	
	Nurses are important too!	<p><b>Animal Nursing</b></p> <p>18) Design a plan of care by interpreting patient records and treatment plans, and perform basic nursing and patient monitoring tasks.</p> <p>19) Outline basic first aid, wound care, and bandaging procedures and compare the different procedures in relation to small and large animals. Demonstrate, in a live setting or in a presentation, the ability to follow these procedures precisely, while distinguishing between small and large animals for the following areas: a. Canine cardiopulmonary resuscitation (CPR) procedures b. Assessment and care of common physical injuries such as cuts, abrasions, and contusions c. Wound therapies at different phases of healing d. Types and purposes of bandages, splints, slings, and casts, and indications for use e. Techniques for application and removal of bandages f. Caring of animals during the birthing process</p> <p>20) Research and explain laws and regulations related to the administration of prescription and over-the-counter medication within the veterinary industry to develop a customer fact sheet for common medicines, citing specific text from legislation. Demonstrate, in a live setting or in a presentation, the ability to follow medication administration procedures precisely, including: a. Identification of common medications and their required storage, handling, and disposal b. Demonstration of administration techniques for topical and oral medications c. Interpretation of medication label and packaging information d. Calculate proper dosages of medications based upon label directions</p>	
9	Put it practice!	<p><b>Laboratory Procedures</b></p> <p>21) Compare and contrast appropriate laboratory quality control procedures such as the proper collection, preparation, handling, and storage of biological samples, and describe their effects on obtaining accurate data from laboratory procedures.</p>	

		<p>22) Develop a procedural check sheet to aid in conducting veterinary clinical hematology procedures such as complete blood count (CBC). Using the check sheet, demonstrate, in a live setting or in a presentation, the ability to follow clinical hematology procedures precisely in relation to the following areas: a. Sample collection, preparation, and storage b. Microscopic examination to identify blood cells c. Interpretation of normal and abnormal results</p> <p>23) Explain and justify the need for conducting urinalysis and fecal analysis as related to animal health. Outline procedures for conducting clinical urinalysis to include the following: a. Sample collection, preparation, and storage b. Physical, chemical, and microscopic examination procedures c. Interpretation of normal and abnormal results</p>	
<p><b>10</b></p>		<p><b>Principles of Disease</b></p> <p>24) Compare and contrast the role of the USDA, state veterinarians, state animal disease laws, and diagnostic labs in disease prevention and control. Explain the classification of diseases and disease processes, and identify causative factors and agents of disease in a graphical illustration or written analysis.</p> <p>25) Explain how diseases affect the body and differentiate between clinical signs and symptoms of disease. Identify and describe the differences between clinical signs and symptoms of proper health and poor health.</p> <p>26) Identify symptoms of common animal diseases and their causative agents, and summarize methods of prevention, treatment, and control by drawing evidence from informational texts or recent medical literature.</p> <p>27) Describe the clinical signs of an animal with a parasite infection. Compare and contrast the symptoms of common internal and external parasite infections and summarize methods of prevention, treatment, and control between small and large animals.</p>	

<p><b>11</b></p>	<p>The cool stuff!</p>	<p><b>Clinic Management</b></p> <p>28) Demonstrate effective oral and written communication skills needed in clinical settings, including but not limited to client greeting, telephone answering, appointment scheduling and management, and admission and discharge procedures. Outline the procedures for euthanasia and post mortem customer care and role-play appropriate grief counseling services for clients.</p> <p>29) Identify the types of medical records required in veterinary practices. Explain, justify, and demonstrate correct procedures for the completion and filing of veterinary records and related documentation in a professional and legal manner.</p> <p>*****Veterinarians, veterinary practices, and schools visits.****</p>	
<p><b>12</b></p>	<p>It's over!</p>	<p>Course Review &amp; Exam</p>	