NAPA COUNTY OFFICE OF EDUCATION – CAREER TECHNICAL EDUCATION
Standardized Course Outline Format

COURSE TITLE
P CTE Animal Science

DATE
2018 (NEW VERSION)

INDUSTRY SECTOR/PATHWAY
Agriculture and Natural Resources / Animal Science

UC A-G APPROVED
Approved for g elective credit, July 2018 (did not pass d lab credit)

GRADE LEVELS
10, 11, 12

OCCUPATIONS FOR IDENTIFIED PATHWAY
Veterinarian Technician
Animal Caretaker/Kennel Operator
Animal Breeder
Ranch Manager
Feed Nutritionist

COURSE OVERVIEW
This course is the second course (after Ag Biology) in the 4-level Animal Science Pathway. This course is designed to provide an in-depth classroom and hands on laboratory experience in Animal Science. The course provides a survey of the livestock industry including animal products, their uses, and contributions to the agriculture industry. Students learn the interactions between animal anatomy and physiology, behavior, nutrition, reproduction, genetics and health. Students learn how science applies to animal production and management. Professionalism and academic skills are integrated into all units and projects. Students have hands on experiences with livestock animals at the Vintage Farm, in addition, out of school animal science production activities will be strongly encouraged.

Assessment Including Methods and/or Tools
Students are evaluated on their understanding of the content objectives and acquisition of animal science skills. Assessments are in a variety of formats including but not limited to multiple choice exams, short answer quizzes/exams, discussions, lab participation and evaluation of hands-on projects including research projects.
Due to the co-curricular nature of FFA (Future Farmers of America) and SAE (Supervised Agricultural Experience) students are also graded on these as activities as components of the course.

COURSE CONTENT

Unit 1: Animal Behavior and Safety
Learning Objectives:

- History of the Domestication of Animals
- Animal Behavior: Students recognize and predict animal behaviors.
- Safety Practices: Students demonstrate proper handling techniques.
- Livestock Restraint: Students demonstrate restraint techniques on a variety of livestock and domesticated animals.
- Livestock Facilities: Students demonstrate the correct and safe use of animal facilities and housing.
- Tools and Equipment: Students use all equipment safely and effectively.

Sample Assignments or Projects
Students research and write a report on the history of animal domestication/production or on the differences in animal production techniques in different cultures. Students present their findings.

Students study the behavior habits of animals and predict behavior responses in given situations.

Students research animal behaviorists and models of modifications to improve animal performance and handling. Students present their research.

Students create videos demonstrating different animal restraint techniques.

Students contribute to the operation of the VHS Farm.

Anchor Standards: 1.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 5.4, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 7.3, 7.4, 7.5, 7.7, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 9.2, 9.3, 9.6, 9.7, 9.8, 9.10, 9.11, 9.12, 9.13,10.1, 10.2, 10.3, 10.4, 10.8, 11.1

Pathway Standards: D1.1, D1.2, D1.3, D1.4, D12.7

Unit 2: Introduction to Animal Anatomy and Physiology

Learning Objectives:

- Review Essential Standards from Ag Biology
- Overview of Animal Livestock Classifications and Terminology
- Overview of Tissues: students will describe the properties, locations, functions and varieties of epithelial, connective, muscle, and nerve tissues.
- Overview of Body Systems with emphasis on these systems:
    1. Musculoskeletal: Students detail the structure of skeletons, bones, joints, muscle groups, and their role in movements. Compare and contrast species differentiation.
    2. Integumentary: Students identify and describe the functions of the integumentary system in animals.
    3. Digestive: Students analyze the components, structure and function of the digestive system in common livestock species. Explain digestion in monogastrics, digestive tract function, absorption and the role of the liver in digestion and metabolism. Compare and contrast specialization of dentition in different livestock species.
    4. Cardiovascular and Respiratory: Students analyze the components, structure, and function of the cardiovascular and respiratory systems in common livestock species. List blood components and explain the function of blood, identify the structures of the heart, vessels and lungs.
    5. Endocrine and Reproductive: Students name the major endocrine glands, list the hormones secreted by each and describe the functions of these hormones.Students understand how the endocrine and reproductive systems relate to reproductive management practices and fetal development.
    6. Nervous: Students describe the parts of a neuron, and the major structures of the brain and spinal cord.

Sample Assignments

Students analyze the body systems of different animal species, distinguish between specific organs and their functions in maintaining homeostasis.

Students compare and contrast the anatomy and physiology of different species of animals for livestock production: cattle, sheep, swine, goats, and poultry.

Students analyze four animals of each species based on specific criterion. Students identify the desirable traits for each and rank animals based on desirability. Students write a report and present their results defending their rationale for their rankings.

Students write a book or create a presentation for elementary students about the different animals at the VHS Farm and how they become food, clothing, or other consumable.

Anchor Standards:2.4, 2.5, 2.6, 4.2, 4.6, 4.7, 5.1, 5.2, 5.3, 5.4, 6.4, 6.5, 6.6, 7.2, 7.3, 7.4, 7.5, 7.7, 8.6, 8.7, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.9, 9.12, 9.13, 10.1, 10.2, 10.3, 10.4, 11.1, 11.2, 11.5
Pathway Standards: D3.1, D3.2, D3.3, D5.1, D5.2, D12.2, D12.3, D12.4

Unit 3: Animal Reproduction
Learning Objectives:

- Sperm and Egg Production: Students explain the male and female reproductive systems of livestock and the process of meiotic division to form sperm and ova.
- Dominant and Recessive Genes: Students understand the basic theory of inheritance, the genetic basis for animal selection, the process of fertilization, and the role(s) of DNA and RNA
- Breeding Systems and Situations: Students describe breeding systems commonly used in animal production and explain the significance of artificial insemination and embryo transfer.
- Selection and Heritability: Students apply cell theory of inheritance to determine heritability of certain traits. Students use probability to predict the phenotype and genotype of a dominant/recessive gene pair to F2 generation.
- Artificial Insemination and Embryo Transfer: Students summarize the process of artificial insemination and outline the steps for embryo transplant. Estrous Cycles and Breeding Capacities: Students plan, predict and manage animal matings to meet a production goal.
- Gestation and Parturition: Students conduct live reproductive examinations to monitor fetal growth and development.
- Environment and Care of Reproducing Animals: Students assist in mating, birthing and weaning of livestock.
- Crossbred Identification: Students test the outcome of matings and propose corrections.

Sample Assignments
Students research and describe the role of animal breeders. They describe the advantages and disadvantages of inbreeding, linebreeding, outcrossing, and cross breeding.

Students participate in a real life animal reproduction project then they present the results to an authentic audience.

Anchor Standards: 2.4,2.5, 2.6, 3.5, 4.1, 4.2, 4.3, 4.5, 4.7, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 11.1, 11.2, 11.3, 11.4, 11.5
Pathway Standards: D4.1, D4.2, D4.3, D4.4, D4.5, D5.3, D5.4, D5.5

Unit 4: Animal Nutrition

Learning Objectives:

- Feed Identification and Nutrient Evaluation: Students demonstrate understanding of the principles of animal nutrition and feeding. Students trace and explain the pathway of food through the two main types of digestive systems and the interrelationships between the body systems and organs related to nutrition. Students discuss the role of water, carbohydrate, fats, proteins, minerals and vitamins in nutrition
- Feeding Reproducing Animals: Students understand how to adjust feed to meet the nutritional needs of reproducing animals.
- Feed Additives and Hormones: Students demonstrate knowledge of feed additives such as hormones and the pros and cons of each.
- Developing Rations: Students calculate percent crude protein, percent digestibility, and percent dry matter of given foodstuffs.
- Vitamin and Amino Acid Requirements: Students demonstrate their knowledge of nutrient requirements by conducting feed trials and evaluating the performance of a given species on a provided nutrient regimen.
- Nutritional Diseases: Students demonstrate knowledge of the causes and treatment of nutritional diseases
- Feeding Regime: Students compare and contrast different feeding regimes.
- Cost Efficiency of Production: Students compare and contrast the value and cost of feed and its effect on production.

Sample Assignments

Students write a paper or presentation comparing and contrasting the structures and functions of monogastric, ruminant and poultry digestive systems.

Students demonstrate proper nutritional management of livestock at the VHS Farm.

Students debate the use of hormones, antibiotics and other feed additives vs organic livestock production.

Anchor Standards:2.5, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.3, 5.4, 6.4, 6.6, 7.2, 7.3, 7.4, 7.7, 8.1, 8.3, 8.4, 9.3, 9.7, 9.8, 9.9, 9.10, 9.11, 9.13, 10.1, 10.2, 10.3, 10.4, 10.6, 10.7, 10.8, 11.1, 11.2, 11.3, 11.4, 11.5

Pathway Standards: D2.1, D2.2, D2.3, D2.4

Unit 5: Animal Health
Learning Objectives:

- Disease Fighting Agents: Students identify zoonotic diseases and treatment options.
- Cause of Disease: Students understand the nature of disease as it applies to health problems. Students demonstrate preventative techniques and treatments based on disease symptoms.
- Infectious and Noninfectious Diseases: Students practice skills in diagnosis of diseases based on symptoms.
- Health Practices: Students practice proper sanitation procedures and disease prevention measures.

Sample Assignments
Students demonstrate their knowledge through proper vaccinations, tail docking, castrations, identification tagging, handling, diagnosis and management of disease in livestock.

Students research and present examples of animal health legislation.

Students create a response plan to a simulated emergency ie: fire, flood or outbreak of epidemic of an infectious disease.

Anchor Standards: 2.6, 3.6, 4.7, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 7.3, 7.4, 7.8, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 9.5, 9.6, 9.7, 9.9, 9.12, 9.13, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.811.1, 11.2, 11.3, 11.4, 11.5

Pathway Standards: D6.1, D6.2, D6.3, D6.4, D6.5, D6.6, D6.7

Unit 6: Livestock Pests
Learning Objectives:

- Common Internal Parasites Life Cycles
- Common External Parasites Life Cycles

Sample Assignments
Students understand the life cycle and production problems associated with internal and external pests and parasites.

Students explain the control measures for these pests and parasites and develop their own parasite control program.

Anchor Standards: 2.6, 3.6, 4.7, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 7.3, 7.4, 7.8, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 9.5, 9.6, 9.7, 9.9, 9.12, 9.13, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.811.1, 11.2, 11.3, 11.4, 11.5
Pathway Standards: D6.3, D6.4, D6.5, D6.6

Unit 7: Large/Small Animal Management
Learning Objectives:

- Production Practices and Systems: Students understand the principles of animal production, marketing, management and record keeping. Students apply scientific principles to evaluate effective management practices.
- Fitting, Showing and Marketing Livestock: Students describe the different production and marketing strategies, the characteristics of each and their economic importance.

Sample Assignments
Students produce, show and market animals at the local fair.

Anchor Standards: 3.1, 3.2, 6.6, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 8.1, 8.2, 8.3, 8.4, 9.5, 9.9, 9.10, 9.13, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 11.1,11.2, 11.3, 11.4, 11.5

Pathway Standards: D10.1, D10.2, D11.1, D11.2, D11.3, D11.4, D12.1, D12.5, D12.6

Unit 8: Animal Welfare
Learning Objectives:

- Ethics of Animal production: animal rights, ethical handling and processing
- Management Rationale
- Public Perception: differing views, changes in practices.

Sample Assignments
Students debate the pros and cons of different kinds of poultry production facilities: free range, cage size, etc. and give rationale for their arguments.

Students research animal rights organization such as PETA, SPCA, etc. and present their findings.

Students research the history of laws and regulations concerning the treatment of animals, write and present findings.

Anchor Standards: 2.5, 2.6, 4.6, 5.1, 5.2, 5.3, 5.4, 8.2, 8.3, 8.5, 8.7, 9.7, 9.11, 10.1, 10.1, 10.2, 10.4

Pathway Standards: D9.1, D9.2, D9.3, D9.4

Unit 9: Range and Waste Management

Learning Objectives:

- Range Management: Students understand effective range management practices, including calculation of carrying capacity of rangeland.
- California Rangelands and Rangeland: Students explain how range management practices affect animal health, erosion control, pasture production and the overall balance of the California ecosystem.
- Common Weeds, Brush and Poisonous Plants: Students identify common rangeland forage and legumes, poisonous plants, weeds and shrubs.
- Animal Waste: Students understand the problems associated with animal waste management and identify types of agricultural wastes. Students analyze different methods of disposal and cost effective recycling of wastes including consideration of environmental impacts.

Sample Assignments

Given a scenario of a plot of land, a species of livestock and a start up budget, students work in collaborative groups to design an animal production facility (farm) a production plan, a range management plan, a waste management plan, and a marketing plan. Students present their work.

Students apply the principles of effective land and waste management to the VHS Farm

Anchor Standards: 2.5, 4.3, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 8.2, 9.7, 9.10, 9.13, 10.1, 10.2, 10.4, 10.8, 11.1, 11.5

Pathway Standards: D7.1, D7.2, D7.3, D7.4, D8.1, D8.2, D8.3

Unit 10: Leadership through FFA

Learning Objectives:

- Record Books: Students keep records utilizing a variety of methods and systems. They explain the differences between production and financial records.

- Supervised Agricultural Experience Program: Students complete an SAE.
- Leadership Training: Students are actively involved in FFA.

Sample Assignments

Students recognize the traits of effective leaders, and participate in leadership training activities associated with the FFA including public speaking, leading group discussions, working with a committee, conducting business meetings and problem solving.

Students engage in supervised agricultural experience program employing the skills and knowledge that they learned in the classroom.

Anchor Standards: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, 9.13, 11.5

Pathway Standards: D10.1, D10.2

Unit 11: Career Preparation

Learning Objectives:

Understand how personal skill development affects employability:

1. Follow classroom and policies and procedures.
2. Understand and practice ethical standards and social responsibilities associated with the Animal Science Pathway.
3. Discuss and define personal hygiene and acceptable business attire and grooming.
4. Learn methods for prioritizing tasks and meeting deadlines.
5. Demonstrate the following personal skills:
   - positive attitude
   - self-confidence
   - ethics
   - integrity
   - honesty
   - perseverance
   - self-discipline
6. Demonstrate the appropriate use of cell phone.

Understand and practice interpersonal skills:

1. Identify and discuss the key concepts of group dynamics.
2. Discuss and demonstrate the dynamics of conflict resolution and negotiation.
3. Work cooperatively, share responsibilities, accept supervision, and assume leadership roles.

4. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups.
5. Discuss laws which apply to sexual harassment and discuss tactics for handling harassment situations.

Practice good academic skills:

1. Recognize the importance of good reading, writing, and math skills and implement a plan for self-improvement.
2. Exhibit critical and creative thinking skills and logical reasoning skills.
3. Recognize problem situations; identify, locate, and organize information or data; and propose, evaluate, and select from alternative solutions.

Understand and practice effective communication:

1. Read and implement written instructions.
2. Present a positive image through verbal and nonverbal communication.
3. Demonstrate active listening through oral and written feedback.
4. Communicate effectively orally and in writing.

Understand occupational safety and implement good safety practices:

1. Avoid and report any physical hazards in the work environment.
2. Practice safe operation of equipment.
3. Demonstrate proper handling of hazardous materials including Bloodborne pathogens.
4. Demonstrate and apply universal precautions.

Understand and adapt to changing technology:

1. Effectively use current computer software.
2. Understand the importance of lifelong learning in adapting to changing technology.

Sample Assignments

Career preparation and employability skills will be integrated into all units of the Animal Science course.

Students demonstrate their knowledge and skills through real-world situations.

Students identify and research animal science related careers and post secondary options.

Anchor Standards: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9
Pathway Standards: D11.4, D12.6

PREREQUISITES

Agriculture Biology

ACADEMIC CREDIT
1 year/10 credits

CERTIFICATION
None, consider iCEV

ARTICULATION
None

INSTRUCTIONAL STRATEGIES
Lecture and Demonstrations
Multimedia Sources
Project-Based Learning
Work-Based Learning
Hands on at Farm

INSTRUCTIONAL MATERIALS / TEXTBOOKS

Animal Science, James R. Gillespie, Delmar Publishers 1998?

STANDARDS SUMMARY
Agriculture and Natural Resources Knowledge and Performance Anchor Standards:1.0, 2.1-2.6, 3.1 - 3.9, 4.1 - 4.7, 5.1 - 5.4, 6.1 - 6.7, 7.1 - 7.8, 8.1- 8.7, 9.1 - 9.13, 10.1 - 10.8, 11.1 - 11.5.
Animal Science Pathway Standards: D1.1-1.4, D2.1-2.4, D3.1-3.3, D4.1-4.5, D5.1-5.5, D6.1-6.7, D7.1-7.4, D8.1-8.3, D9.1-9.4, D10.1-102, D11.1,-11.4, D12.1-12.7
Common Core and Academic Standards: RLST 9-103, 9-10.4, 9-105, 9-10.7, 11-12.3, 11-12.4, WS 9-10.4, 9-10.7, 9-10.8, 9-10.9, 11-12.4, 11-12.7, 11-12.9, 11-12.10, A-REI 3, F-IF 4, G-CO 12, G-MD 3, G-MG 2, G-SRT 8, S-IC 1, 3, 5, S-ID 1, 2, 7, SEP 1, 2, 3, 4, 5, 6, 7, 8, CC 1,2, 3, 4, 5, 6, 7, PS1, PS3.D, LS 1, 2, 3, 4.B, ETS2