

Ag Science Careers

COURSE OUTLINE

1. **Course Title:** Veterinary Science
2. **CBEDS Title:** Other health careers course
3. **CBEDS Number:** 4. **Job Titles:**
 - Dog Groomer
 - Dog Bather
 - Veterinarian
 - Veterinary Technician

5. Course Description: This course provides in depth study of the anatomy and physiology of a variety of animal species and is designed to build knowledgeable problem solvers in the field of Veterinary Science. Students will acquire advanced animal principles, know and respect diversity in the animal kingdom, and become an animal advocate for their welfare on all levels encompassing family pets, domestic livestock and our wildlife resources.

6. Objectives:

Upon completion of this course, the students will be able to:

Anatomy and Physiology:

- A. Explain the molecular makeup of cells, their basic structure and corresponding functions
- B. Discuss mitosis and its clinical significance and detail in mammalian reproduction
- C. Describe properties, locations, functions and varieties of epithelial, connective, muscle and nerve tissues
- D. Describe the functions of musculoskeletal system
- E. Detail the structure of the bone, name joint types and accompanying role in movement
- F. List two major sections of the skeleton, name corresponding bones, and compare species differentiation
- G. Explain how bone grows and remodels; relate bone and muscle groups to movement
- H. List blood components and explain the functions of blood
- I. Identify the basic structures of the mammalian heart; trace flow of blood, detail parts of blood vessels and their structural significance
- J. Use knowledge of heart function and control to explain the clinical significance of the electrocardiogram, hear sounds, including heart murmurs and blood pressure
- K. Identify basic components of the respiratory tract; list and discuss function and control of breathing
- L. Identify and name basic structures and functions in the renal system
- M. Identify structures within the kidney and detail the formation of urine and its regulation
- N. Identify basic structures of the digestive system, explain digestion in monogastrics, including digestive tract function, absorption and the role of the liver in digestion and metabolism
- O. Compare and contrast the specialization of dentition and digestive tracts
- P. Identify male anatomy and related associated hormonal function

- Q. Discuss female anatomy and the estrous cycle; list steps in establishing pregnancy and identify stages of parturition
- R. Describe the neuron, the nerve impulse and the synapse and explain the components of a reflect arc
- S. Identify the major structures of the brain
- T. Discuss the anatomy and function of the spinal cord
- U. Compare and contrast the function of the sensory somatic system to the autonomic nervous system and differentiate between the two branches of the autonomic system
- V. Describe the endocrine system; name the major endocrine glands, list the hormones secreted by each gland, and describe the functions of these hormones
- W. Define the term antigen and explain its significance in immunity; distinguish between passive and active immunity

Nutrition:

- A. List the six major components of animal diets, and discuss their structure and significance in nutrition
- B. Explain the general principles in animal nutrition
- C. discuss the difference between dogs, cats and equine nutrition needs

Infectious Diseases:

- A. Describe Koch's postulates
- B. List the important distinguishing features and give example of major disease agents and discuss resulting diseases
- C. Name the basic components of disease prevention
- D. Describe the types of vaccines available and their roles in disease prevention
- E. Classify diseases, match them with the domestic species in which they occur, and discuss their clinical significance
- F. List and describe several diseases common in domestic animals that are contagious to humans
- G. List the major methods used to diagnose disease and cite examples of disease diagnosis with each testing method

Principles of Surgery:

- A. Explain the clinical significance of the basic principles of successful surgery
- B. Explain the healing of lacerations

Pharmacology:

- A. Define terms relating to general pharmacology
- B. Explain the five schedules of controlled substances and their common use
- C. Become familiar with pharmacologic agents, their uses, adverse side effects and dosage form
- D. Identify the parts of drug labels and inserts
- E. List routes and describe route of drug administration and routes of drug excretion
- F. Define biotransformation and list common chemical reactions involved in this process

Genetics:

- A. Debate the pro and con of genetic engineering animals for food, conservation and domestic pets
- B. Describe the theory of classification of the animal kingdom
- C. List common genetic diseases and disorders

Professional Opportunities:

- A. List requirements to become a registered animal health professional in California
- B. Outline the steps to acquiring a veterinary license in California

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- C. Explain what work ethics are and give examples of their importance in the health profession
- D. Create a professional portfolio and demonstrate its use in the interview process for college or work

Pathway

Recommended Sequence	Courses
Introductory	Agriculture Science Basic Core
Skill Building	Animal Science
Advanced Skill	Veterinary Science

6. Hours: *Students receive up to 180 hours of classroom instruction.*

7. Prerequisites: Introduction to Health Occupations

8. Date (of creation/revision): July 2011

9. Course Outline

COURSE OUTLINE				
Upon successful completion of this course, students will be able to demonstrate the following skills necessary for entry-level employment.				
Instructional Units and Competencies	Course Hours	Industry Standards	CA Academic Content Standards	CAHSEE
<p>I. CAREER PREPARATION</p> <p>A. Career Planning and Management.</p> <ol style="list-style-type: none"> 1. Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers. <ol style="list-style-type: none"> a. Students will identify skills needed for job success b. Students will identify the education and experience required for moving along a career ladder. 2. Understand the scope of career opportunities and know the requirements for education, training, and licensure. <ol style="list-style-type: none"> a. Students will describe how to find a job. b. Students will select two jobs in the field and map out a timeline for completing education and/or licensing requirements. 3. Know the main strategies for self-promotion in the hiring process, such as completing job applications, resume writing, interviewing skills, and preparing a portfolio. <ol style="list-style-type: none"> a. Students will write and use word processing software to create a resume, cover letters, thank you letters, and job applications. b. Students will participate in mock job interviews. 4. <i>Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options.</i> <ol style="list-style-type: none"> a. <i>Students will conduct a self—assessment and explain how professional qualifications affect career choices.</i> 5. <i>Understand the role and function of professional organizations, industry associations, and organized labor in a productive society.</i> <ol style="list-style-type: none"> a. <i>Contact two professional organization and identify the steps to become a member.</i> 6. <i>Understand the past, present and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning.</i> <ol style="list-style-type: none"> a. <i>Students will describe careers in the business industry sector.</i> b. <i>Students will identify work-related cultural differences to prepare for a global workplace.</i> <p>B. Technology.</p> <ol style="list-style-type: none"> 1. Understand past, present and future technological advances as they relate to a chosen pathway and on selected segments of the economy. 2. Understand the use of technological resources to gain access to, manipulate, and produce information, products and services. 3. Use appropriate technology in the chosen career pathway. <p>C. Problem solving and Critical Thinking.</p> <ol style="list-style-type: none"> 1. Understand the systematic problem-solving models that 	<p>10</p> <p>Additional hours are integrated throughout the course.</p>	<p>Agriculture & Natural Resources Industry sector 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.0, 4.4</p>	<p><u>Language Arts</u> (8) R 1.3, 2.6 W1.3, 2.5, LC 1.4,1.5, 1.6 LS1.2, 1.3, (9/10) R2.1,2.3,2 W2.5 LC1.4 LS 1.1, 2.3 (11/12) R2.3 W2.5 LC1.2 <u>Math</u> (7) NS1.2, 1.7 MR 1.1,1.3 2.7,2.8, 3.1</p>	<p>Lang. Arts R 8.2.1 (9/10) R 2.1, 2.3 W2.5 Math (7) NS 1.2, 1.3, 1.7 MR 1.1, 2.1, 3.1</p>

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<p>incorporate input, process, outcome and feedback components, and apply appropriate problem-solving strategies and critical thinking to work-related issues and tasks.</p> <ol style="list-style-type: none"> 2. Use and apply critical thinking and decision making skills to make informed decisions, solve problems, and achieve balance in the multiple roles of personal, home, work and community life. <p>D. Health and Safety.</p> <ol style="list-style-type: none"> 1. Know policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities. 2. Understand critical elements of health and safety practices related to a variety of business environments. <p>E. Responsibility & Flexibility.</p> <ol style="list-style-type: none"> 1. Understand the qualities and behaviors that constitute a positive and professional work demeanor. 2. Understand the importance of accountability and responsibility in fulfilling personal, community, and workplace roles and how individual actions can affect the larger community. 3. Understand the need to adapt to varied roles and responsibilities. <p>F. Ethics and Legal Responsibilities</p> <ol style="list-style-type: none"> 1. Know the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations. 2. Understand the concept and application of ethical and legal behavior consistent with workplace standards. <ol style="list-style-type: none"> a. <i>Contact a business and obtain a copy of their rules for employment.</i> b. <i>Role play difference ethical scenarios.</i> 3. Understand the role of personal integrity and ethical behavior in the workplace. <p>G. Leadership and Teamwork.</p> <ol style="list-style-type: none"> 1. Understand the characteristics and benefits of teamwork, leadership, citizenship in the school, community, and workplace settings for effective performance and attainment of goals. 2. Understand the ways in which professional associations, such as FFA, and competitive career development activities enhance academic skills, career choices, and contribute to promote employability. 3. Know multiple approaches to personal conflict resolution and understand how to interact with others in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others. 				
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Instructional Units and Competencies	Hours	Industry Standards.	CA Academic Standards	CAHSEE
I Introduction to Pre-Veterinary Science A. Safety and Regulations B. Laboratory skills and equipment C. Research and data collection procedures D. Medical terminology	3	Agriculture & Natural Resources Industry Sector Animal Science Pathway	ELA 11-12; R; 1.1-1.3, 2.1-2.6 W; 1.1-1.5, 1.6, 1.8, 1.9, 2.1-2.6	
II. Anatomy and Physiology A. Cells of the animal body B. Cell makeup, structure and function C. Mitosis and Meiosis	4	D3.0 D3.1 D3.2 D5.0 D10.2		
III. Tissue types and functions A. Epithelial B. Connective C. Muscle D. Nerve	5		ELA 9-10; R; 2.6	
IV. Musculoskeletal system A. Musculoskeletal system functions B. Bone structure, growth and remodeling C. Joint types and movements D. Axial and appendicular skeletons	5		ELA 9-10; R; 2.1, 2.2, 2.3, 2.5, 2.8 W; 1.1-1.9	
V. Circulatory System A. Blood components and functions B. Mammalian heart structures C. Blood vessels and blood flow D. Electrocardiograms, heart sounds and blood pressure	5			
VI. Respiratory System A. Respiratory tract B. mechanisms of breathing	5		ELA 11-12; R; 1.1-1.3, 2.1-2.6 W; 1.1-1.5, 1.6, 1.8, 1.9, 2.1-2.6 M. 8-12; Geom.; 22.0 S. 7; 6h	

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Instructional Units and Competencies	Hours	Industry Standards	CA Academic Standards	CAHSEE
VII. Renal system A. Renal system structure and functions B. Kidney structure and urine formation and regulation C. Urine and blood evaluation	5	Agriculture & Natural Resources Industry Sector Animal Science Pathway D2.2 D2.3 D3.1 D4.1 D4.3 D6.2 D6.3 D6.4 D6.6	ELA 9-10; R; 2.6.	
IX. Digestive System A. Digestive system structures B. Monogastric digestion C. Ruminant digestion	5			
X. Reproductive System A. Male and female anatomy hormonal function B. Pregnancy and parturition	5		S. 7; 5c	
XI. Central Nervous System A. Neuron function	7		ELA 9-10; R; 2.1, 2.2, 2.3, 2.5, 2.8 W; 1.1-1.9	
XII. Nutrition A. Basic nutrients B. Species comparison C. Animal nutrition	5		ELA 9-10; R; 2.6. S. 7; 5c	
XIII. Common Diseases & Disorders A. Principles of infectious disease, Koch's postulates B. Disease agents and prevention C. Vaccines, classifications of diseases D. Parasites (endoparasites and extroparasites) E. Viral, bacterial, fungal, protozoan zoonotic F. Diagnosis of disease	5		ELA 9-10; R; 2.6. S. 7; 5c	
XIV. Principles of Surgery A. Laceration healing B. Surgical considerations	5		ELA 9-10; R; 2.6. S. 7; 5c	
XV. Pharmacology A. Classification and chemistry of common drugs B. Determine amount and correctly measure prescribed medication using medical math, calculation, conversions	5		ELA 9-10; R; 2.6. S. 7; 5c	

Instructional Units and Competencies	Hours	Industry Standards	CA Academic Standards	CAHSEE
XVI. Genetics and Heredity A. Theory of Classification – Taxonomy B. Animal Kingdom – vertebrate and invertebrates C. Genetic diseases and disorders D. Current issues and ethics	6	Agriculture & Natural Resources Industry Sector Animal Science Pathway D5.2 D5.3	ELA 9-10; R; 2.6. S. 7; 5c	
XVII. Veterinary Science Research Presentation A. Current animal research and investigation B. Data presentation, summarization and conclusion	5		ELA 9-10; R; 2.6. S. 7; 5c	
XVIII. Agricultural Inter-Personal & Leadership Development A. Completion of a Supervised Agriculture Experience program and Record Book B. Development of listening, speaking, writing and reading skill activities C. Speaking and seminar presentations	90		ELA 9-10; R; 2.1, 2.2, 2.3, 2.5 W; 1.1-1.7, 1.9	

10. Additional recommended/optional items

a. Articulation: None

b. Academic credit: N/A

c. Instructional strategies:

Methods of Instruction:

- a. Lecture
- b. Tests and quizzes
- c. Homework assignments
- d. Term paper
- e. Notebook
- f. Portfolio
- g. Laboratory activities
- h. SAE project and record book
- i. FFA and leadership development activities

d. Instructional materials:

Introductorion to Veterinary Science, Lawhead and Baker. Thomson Learning First Edition. 2007.

The Dynamics of Life, Glencoe McGraw Hill.

An Illustrated Guide to Veterinary Medical Terminology, 1st Ed., Janet A. Romich.

Clinical Textbook for Veterinary Technicians, Robert Bill, DVM.

Pharmacology for Veterinary Technicians, Robert Bill, DVM.

Handbook of Veterinary Anesthesia, William Muir, DVM, Mosby Company.

Clinical Anatomy & Physiology for Veterinary Technicians, Mosby-Harcort Science co.

e. Certificates: None