##### LASSEN HIGH SCHOOL

**I. Course Identification**

 A. Course Title: Integrated Animal Science

 B. Grade Level: 11th or 12th Grade, 1 year

 C. Nature of Course: Elective / Life Science Requirement

 D. Credit: 10 Units

**II. Brief Description of the Course**

This course provides lecture information, activities, and skills in the areas of scientific method, classification systems, mammalian production, production management, health care, anatomy, physiology, reproduction, nutrition, mitosis, meiosis, respiration, and genetics. Emphasis is placed on mammals, which are most important to human culture, as we know it. Homework varies by unit, but averages about one assignment per week. Tests will be given regularly and students will be expected to participate in assignments, class discussion, extensive reading and writing and other structured events. Notebooks are required and graded periodically.

**III. Course Performance Goals**

Upon completion of this course, a student will be able to:

A. Appreciate the varied yet intricate world of biological science.

B. Display knowledge of animal production practices.

C. Relate the anatomy and physiology of mammals.

D. Demonstrate skills inherent to biological sciences.

**IV. Course Outline**

A. Economic Impact (Two Weeks)

1. Content and methodology

2. Demographics

3. Social economic balance

4. Plant and animal balance

5. Human health and nutrition

6. Scientific Classification System

B. Science Framework Standards

1. What are the characteristics of living things?

2. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

3. What are the relationships of living organisms and how are living things classified?

4. How do humans interact with other living things?

1. What are cells? What are their component structures and their functions?
2. How do they grow? What is the biochemical basis of life and of metabolism?

7. What are ecosystems and how do organisms interact in ecosystems?

8. How does energy flow within an ecosystem? How do ecosystems change?

9. What are the responsibilities of humans towards ecosystems?

C. Supplementary Materials

1. Infusing a Global Perspective into Agriculture Education and Instruction packet, ABA Dept., UC Davis

 2. Basic Core Curriculum

D. Laboratory Assignments

1. Food Nutrients - Agriscience Fundamentals and Applications

2. Organizing a Classification System - Biology-Prentice Hall

**II. Anatomy and Physiology (Two Weeks)**

A. Analysis of body systems

B. Physiological function if hormones and auxins

C. Reproductive physiology

D. Process of digestion

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of organisms.

c. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

d. How are the characteristics of living things passed on through generations? How does heredity determine the development of individual organisms?

2. Supplementary Materials

a. The Fetal Pig: Mammalian Vertebrate

b. Modern Biology-Teacher’s Resource Book

**III. Animal Breeding and Genetics (Three Weeks)**

A. Process of mitosis and meiosis

B. Cell theory of inheritance

C. Heritability percentage of traits

D. Artificial insemination

E. Embryo transplants

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. How do humans interact with other living things?

d. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism.?

e. How are the characteristics of living things passed on through generations? How does heredity determine the development of individual organisms?

f. How has life changed and diversified through time? What processes and patterns characterized the evolution of life?

g. What are the responsibilities of humans towards ecosystems?

2. Supplementary Materials:

a. Core Curriculum Animal Science Video Series

b. Conception to Consumer

c. Swine Reproduction

d. Foaling

e. Equine AI

f. Hatching Eggs

g. Parturition

3. Laboratory Assignments:

a. Mitosis and Meiosis, Modern Biology

b. Principles of Heredity

c. Anatomy of Female Reproductive Tract

d. Semen Cell Evaluation

**IV. Phenotypic Selection and Evaluation (Three Weeks)**

A. External anatomy

B. Skeletal identification and position

C. Muscle volume

D. Fat deposition

E. Productivity and performance

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. What are the responsibilities of humans towards ecosystems?

d. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

2. Supplementary Materials:

a. Core Curriculum Animal Science

 b. Computer Software, Project Animal-VEP Genetics Video

3. Laboratory Assignments:

a. Tissues and Organs in Chicken Wings, Animal Science Lab Manuals

b. Examining a Chicken Bone, Animal Science Lab Manual

**V.** **Animal Health and Sanitation (Three Weeks)**

A. Disease and parasites

B. Predisposing factors and conditions

C. Biological preparation, antibiotics

D. Sanitation requirements and procedures

E. Laws involving human consumption, food product retention

1. Science Framework Standards/Life Science:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. What are the relationships of living organisms and how are living things classified?

d. How do humans interact with other living things?

e. How has life changed and diversified through time? What processes and patterns characterized the evolution of life?

f. What are ecosystems and how do organisms interact in ecosystems?

g. How does energy flow within an ecosystem? How do ecosystems change?

h. What are the responsibilities of humans towards ecosystems?

2. Supplementary Materials:

a. Core Curriculum Animal Science

 b. Department of Food and Agriculture Pamphlet USDA-materials

3. Laboratory Assignments:

a. Internal Parasites, Agriscience Fundamentals and Applications-Two Weeks

b. Controlling Diseases with Antibiotics, Agriscience Fundamentals and applications

**VI. Mammalian Nutrition and Feedstuffs (Three Weeks)**

A. Classes of nutrients and additives

B. Animal nutrition and requirements

C. Analysis of macro and micro animals

D. Vitamin roles

E. Nutrient deficiencies

F. Balancing rations and feed practices

G. Photosynthesis

1. Science Framework/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. How do humans interact with other living things?

d. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

e. How does energy flow within an ecosystem? How do ecosystems change?

f. What are the responsibilities of humans towards ecosystems?

2. Supplementary Materials:

a. Core Curriculum Animal Science

b. Feeds and Feeding, Morrison

c. Vocational Education Production Video/Slide Series:

d. Introduction to Livestock Nutrition

e. Livestock Feeds and Feeding

f. Animal Needs

g. Photosynthesis/Respiration

3. Laboratory Assignments:

a. Gas Production in Photosynthesis

b. Agriscience Fundamentals and Applications

c. Designing a Diet

d. Biology Lab Book, Prentice Hall

e. Balancing Feed Rations Exercise

f. Instructor Provided

**VII. Plants, Livestock and their Management (Five Weeks)**

A. History and principles

B. Habitat

C. New scientific principles

D. Behavioral modification and manipulation

1. Science Framework Standards/Life Sciences:

a. How do humans interact with other living things?

b. What are the responsibilities of humans towards ecosystems?

2. Supplementary Materials:

a. Core Curriculum Plant Science

b. Video Series:

c. Cattle Production

d. Sheep Production

e. Swine Production

f. Poultry

g. Horse Handling

3. Laboratory Assignments:

a. Designing a Forest ecosystem-Biology, Prentice Hall

b. Examining Stages in Ecological Succession-Biology, Prentice Hall

c. Analyzing Ecological Relationships-Two Weeks-Biology, Prentice Hall

d. Comparing Biomes of the United States-Biology, Prentice Hall

**VIII. Animal Research Presentation (Two Weeks)**

A. Current animal research and investigation

B. Data presentation

C. Summarization and conclusion

1. Science Framework Standards/Life Sciences:

a. What are the relationships of living organisms and how are living things classified?

b. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

c. What are ecosystems and how do organisms interact in ecosystems?

d. What are the responsibilities of humans towards ecosystems?

2. Supplementary Materials:

a. Agriculture Periodicals

 b. USDA Materials

 c. Animal Plant Health Inspection Source Information

 d. California Department of Food and Agriculture Leaflets

3. Laboratory Assignments:

a. Hands on Computer Learning

b. Teacher Assigned

c. Conducting a Research Project

**IX. Common Integument and it’s Derivation (Two Weeks)**

A. Epithelium, mesothelium, and endothelium

B. Skin and its function

C. Mammary glands

D. Physiology of lactation

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

2. Supplementary Materials:

a. Core Curriculum Animal Science

 b. Anatomy Illustration-Activities

3. Laboratory Assignments-Two Weeks

a. Describing Skin and Bones-Biology-Prentice Hall

**X. The Nervous System (Two Weeks)**

1. The brain and its function

B. The spinal cord

C. The peripheral nervous system

D. The autonomic system

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism.?

2. Supplementary Materials:

a. Core Curriculum Animal Science

 b. Life Science

3. Laboratory Assignment:

a. Relating the Nervous System to Other Body Systems

 Biology, Prentice Hall

b. Examining the Nervous System

**XI. Respiratory System and Respiration (Two Weeks)**

A. Structure of mammalian respiratory system

B. Physiology of respiration

C. Mechanics of breathing

D. Plant respiration

1. Science Framework Standards/Life Sciences:

a. What are the characteristics of living things?

b. How do the structures of living things perform their functions, interact with each other and contribute to the maintenance and growth of the organism?

c. What are cells? What are their component structures and their functions? How do they grow? What is the biochemical basis of life and of metabolism?

2. Supplementary Materials:

a. Core Curriculum Animal Science

 b. Life Science Software

3. Laboratory Assignments-Two Weeks:

a. Understanding the Physics of Respiration

 Biology, Prentice Hall

**XII. Assessment**

1. Testing:
	1. Students will be given objective tests on a weekly basis. Unit tests will be

 given to require students to use higher-level critical thinking skills.

* 1. Students will be involved in science laboratory exercises. These

 exercises will reinforce each unit’s instruction.

3. Students will be given laboratory quizzes.

4. Students will receive a two-hour comprehensive written final each

 semester which will include laboratory application experiences.

5. Testing will utilize problem-solving methods.

1. Homework Assignments:

Students will participate in a variety of assignments to include extensive reading in the textbooks and reference materials. Students will participate in a variety of ongoing writing activities for evaluation: journals, I-Search papers, and direct writing assignments.

**XIII. Textbooks**

Anatomy and Physiology of Farm Animals, 4th Edition; R.D. Frandsen; Lea and Febiger, Philadelphia, PA

The Science of Anatomy Husbandry, 4th Edition; James Blakely and David H. Bade; Reston Publishing, Reston, VA

Biology, Prentice-Hall

Modern Livestock & Poultry Production, 5th Edition; James R. Gillespie; Delmar Publishers, Albany, NY

**XIV. Supplementary Textbooks and Materials**

A. Infusing a Global Perspective into Agricultural Education and Instruction packet ABA Department, UC Davis

B. The Fetal Pig: Mammalian Vertebrae, Modern Biology – Teacher’s Resource Book

C. Animal Science Video Sources

1. “Conception to the Consumer”

2. “Swine Reproduction”

3. “Foaling”

4. “Equine Artificial Insemination”

5. “Hatching Eggs”

6. “Parturition”

7. “Introduction to Livestock Nutrition”

8. “Animals Needs”

9. “Photosynthesis and Respiration”

10. “Cattle Production”

11. “ Sheep Production”

12. “Swine Production”

13. “Poultry”

14. “Swine Reproduction 1 & 2

15. “Beef Reproduction 1 & 2

16. “Parasites of Farm Animals

17. “Dairy Production and Management”

18. “Embryo Transfer”

D. Computer Software

1. Project animal-VEP

2. Animal Science CD

3. Internet Access

4. Midwest Programs (Reproduction, Dairy Science, Swine Science, Horse Science, Beef Science)

5. Sim-Frog, Sim Pig

E. Genetics Video

F. Department of Food and Agriculture pamphlets

G. USDA materials

H. Feeds and Feeding, Morrison

I. Agriculture periodicals

J. Animal Plant Health Inspection Source Information

K. Anatomy Illustration- Activities

L. Life Science Software

**XV. Suggested Laboratory Manuals**

A. Prentice Hall Biology Laboratory Manual

Prentice, Hall, Allyn and Bacon, USA

B. Modern Biology and Laboratory Manual and Student Guide

Otto, Towle & Otto

Holt Rinehart and Winston, USA

C. Science Laboratory Manual and Teacher’s Guide

California Department of Education