Animal Science

**Meets the UC “g” Admission Requirement**

**Adopted 2003**

**I. COURSE TITLE AND LEVEL:** Animal Science

Length of Course: 2 Semesters

Grade Level: 11-12th grades

Prerequisite: Algebra & Integrated Agriculture Biology

# II. COURSE GOALS AND MAJOR STUDENT OUTCOMES

1. This course will provide the student with principles in Animal Science focusing on the areas mammalian production, anatomy, physiology, reproduction, nutrition, respiration, and genetics. This course is intended to successfully prepare those students who plan on majoring in Agricultural Sciences at a college or university.

B. Frequent opportunities are also given to develop and apply rational and creative thinking processes of observing, comparing, organizing, relating, inferring, applying and communicating. Also, there is an emphasis on developing values aspirations and attitudes that promote the student’s understanding personal involvement with the scientific explorations and discoveries of the future. These hands-on science experiences are designed to enhance the student’s understanding of Agriculture, the environment, and society.

# III. COURSE OBJECTIVES

A. Students will be able to:

1. Assemble and use laboratory apparatus, tools and materials in a skillful manner, giving attention to accident prevention and safety.

2. Gather the qualitative and quantitative information needed for developing and testing inferences and hypotheses by making purposeful, objective observations of things and events.

3. Understand the make up of the body and its functions.

4. Understand how to apply the knowledge of heredity and genetics to mammalian production.

5. Understand evolution and natural selection and how it relates to production agriculture.

6. Record observations accurately and organize data and ideas in ways that enhance their usefulness.

7. Communicate with others (oral and written) in a manner that is consistent with the knowledge of scientific conventions, and facilities the learning of the listeners or readers.

8. Use the metric system effectively in measuring and quantifying substances.

# IV. OUTLINE OF COURSE

A. Economic Impact

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. Plants, Animals, and their Management

1. History and principles

2. Habitat

3. New scientific principles

4. Behavioral modification and manipulation

C. Animal Anatomy and Physiology

1. Analysis of body systems

2. Physiological function of hormones and auxins

3. Reproductive physiology

4. Process of digestion

D. Animal Breeding and Genetics

1. Process of mitosis and meiosis

2. Cell theory of inheritance

3. Heritability percentage of traits

4. Artificial insemination

5. Embryo transplants

E. Animal Phenotypic Selection and Evaluation

1. External anatomy

2. Skeletal identification and position

3. Muscle volume

4. Fat deposition

5. Productivity and performance

F. Animal Health Care

1. Diseases and parasites

2. Predisposing factors and conditions

3. Biological preparation, antibiotics

4. Sanitation requirements and procedures

5. Laws involving human consumption, food product retention

G. Animal Nutrition and Feeds

1. Classes of nutrients and requirements

2. Animal nutrient requirements

3. Analysis of macro and micro animals

4. Vitamin roles

5. Nutrient deficiencies

6. Balancing rations and feed practices

7. Photosynthesis

H. Common Integument and its Derivation

1. Epithelium, mesothelium and endothelium

2. Skin and it’s function

3. Mammary glands

4. Physiology of lactation

I. The Nervous System

1. The brain and its function

2. The spinal cord

3. The peripheral nervous system

4. The autonomic system

J. Respiratory System and Respiration

1. Structure of mammalian respiratory system

2. Physiology of respiration

3. Mechanics of breathing

4. Plant respiration

K. Animal Research Presentation

1. Current animal research and investigation

2. Data presentation

3. Summarization and conclusion

1. Professional Opportunities in Animal Science

1. Animal research fields

2. Other related animal science fields

M. Agricultural Inter-Personal & Leadership Development

1. Completion of a Supervised Agricultural Experience Program and data collection

2. Development of listening, speaking, writing & reading skill activities

3. Critical thinking & group team building activities

4. Agriculture presentations

# V. TEXTS & SUPPLEMENTAL INSTRUCTIONAL MATERIALS

A. Modern Biology (2002). Holt, Rinehart & Winston Publishers

B. ”Applied Animal Reproduction” by H. Joe Bearden and John W. Fuquay: Prentice Hall. ISBN 0-13-081976-X

C. Instructor’s Manual ISBN 0-13-085069-1

D. “Scientific Farm Animal Production” by Robert E. Taylor & Thomas Field: Prentice Hall. ISBN 0-13-020032-8

## VI. KEY ASSIGNMENTS

1. Weekly academic textbook assignments
2. Weekly laboratory activities & report
3. Animal Science Term Paper
4. Supervised Agricultural Experience Project & Record Book
5. Student Seminar Presentation related to Animal Science Topic
6. Portfolio of Laboratory Exercises

# VII. INSTRUCTIONAL METHODS

A. Laboratory Activities and Experiments

B. Lecture and Discussion

C. Reading research Assignments

D. Written and Oral Reports

E. Homework Assignments

F. Audio-Visual Presentations

G. Projects

# VIII. METHODS OF EVALUATION & ASSESSMENT

A. Tests and Quizzes 40%

B. Homework Assignments/Term Paper 15%

C. Notebook/Portfolio 05%

D. Laboratory Activities 20%

E. SAE Project & Record Book 10%

F. Leadership Development Activities 10%

## IX. LABORATORY ASSIGNMENTS

A. The following laboratory activities will be incorporated:

1. Using the microscope

2. Introduction to lab techniques

3. Identify animal cells; by tissue type

4. Cell Chemistry – Periodic table of elements

5. Build a cell model

6. Osmoses & diffusion investigation

7. Contraction of glycenated muscle with ATP

8. Examination and diagram cells microscopically

9. Dissect muscle, bone, and connective tissue

10. Owl pellet dissection

11. Compare and contrast skeletons of mammals, avian, fish

12. Observation & diagram of muscle tissue and bone cells

13. Separate chemical compounds of blood samples, PCV – Total Protein – ph, etc

14. Evaluate sample of different species for normal and abnormal values

15. Compare human norms with animals

16. Dissection of an animal heart

17. Examine stained blood slides for form, function, parasites etc.

18. Pulse & breathing rate

19. Compare metabolic rates of species

20. Aquatic respiration

21. Urinalysis – chemistry and morphology

22. Dilution and toxicity

23. Chemical mechanism of digestion

24. Chemistry analysis that identifies blood glucose levels

25. Chick embryo development

26. Normal system response

27. Animal eye dissection

28. Effects of steroids on growth

29. Fecal analysis for parasites & bacteria

30. Gene regulation

31. Manipulation of DNA

32. Genetic traits & gene regulation