

# AGRI 0200 - INTRODUCTION TO ANIMAL SCIENCE

## Catalog Description

Advisory: Eligibility for ENGL 1A

Hours: 108 (54 lecture, 54 laboratory)

Description: A scientific approach to the field of animal science and the interrelationships of domestic animals and their contribution to the modern agriculture industry. Introduces various disciplines, including cell function, genetics, anatomy and physiology, reproduction, nutrition, animal health, animal products and animal behavior. (C-ID AG-AS 104) (CSU, UC)

## Course Student Learning Outcomes

- CSLO #1: Compare and contrast animal uses, meat and animal product consumption in different cultures and world economies.
- CSLO #2: Relate fundamental physiology of domestic animals to the anatomy of several body systems including but not limited to cardiovascular, reproductive, digestive, endocrine, exocrine, immune and muscle.
- CSLO #3: Apply basic biology discussed throughout the course to the management of domestic animal species.
- CSLO #4: Compare and contrast current technologies used in animal production and assess their impact on management practices.

## Effective Term

Spring 2021

## Course Type

Credit - Degree-applicable

## Contact Hours

108

## Outside of Class Hours

108

## Total Student Learning Hours

216

## Course Objectives

Lecture Objectives:

1. Identify the economic and cultural importance and influence of animal agriculture in the world, the United States, California and the local area.
2. Compare and contrast animal uses and meat and animal product consumption in different cultures and world economies.
3. Describe domestication and the contributions of domestic species and breeds developed by selective breeding.
4. Evaluate data collected in an experiment designed using the scientific method.
5. Compose a scientific paper based on data collected in the course following the format of the journal of animal science.
6. Relate basic cell structure to basic cell function while using the cell theory, the cell cycle, cell division and gametogenesis.

7. Diagram and discuss fundamental principles of genetics including mitosis and meiosis, DNA replication, DNA structure and function, protein synthesis, and gene expression.
8. Calculate gene frequency, probability and genetic progress (genetic change).
9. Identify basic internal and external anatomy of domestic animals using proper terminology.
10. Relate fundamental physiology of domestic animals to the anatomy of several body systems including but not limited to cardiovascular, reproductive, digestive, endocrine, exocrine, immune and muscle.
11. Identify the effects of several hormones including but not limited to progesterone, estradiol, prostaglandin, testosterone, FSH, LH, GnRH, somatotropin, epinephrine, cortisol, and thyroxin.
12. Compare the various digestive types of domestic animal species and the nutritive values of the feedstuff they consume.
13. Assess an animal's nutrient requirements based on their stage of the biological cycle.
14. Relate several basic animal behaviors to environmental conditions and relate to domestication, health and performance.
15. Apply basic biology discussed throughout the course to the management of domestic animal species.
16. Evaluate current technology used in animal production. Areas to be discussed include but are not limited to biotechnology, artificial insemination, embryo transfer, and methods of testing animal products for contamination.
17. Assess several animal agriculture issues.
18. Compare and contrast the effects, both physiological and economic, of various diseases affecting domestic animals and evaluate their impact on human health.
19. Apply basic management strategies for disease control and prevention.

Laboratory Objectives:

1. Demonstrate understanding and appreciation of the methodologies of the natural science as investigative tools and the limitation of scientific inquiry.
2. Demonstrate basic techniques in biotechnology, hematology, and microbiology.
3. Demonstrate basic techniques in small and large animal restraint with safety of the handler and animal as the main priority.
4. Design and carry out an experiment implementing the scientific method and employing basic data collection and analysis procedures.
5. Demonstrate basic skill in live and post-mortem animal evaluation for health, conformation and identification of anatomical parts.
6. Demonstrate the proper procedure for artificial insemination, embryo transfer, and methods of testing animal products for contamination.

## General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Life Sciences
  - AS - Life Science Lab
- CSU GE Applicability (Recommended-requires CSU approval)
  - CSUGE - B2 Life Science
  - CSUGE - B3 Lab Activity
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
  - IGETC - 5B Biological Science
  - IGETC - 5C Laboratory Science
  - IGETC - 5L Laboratory Science

## Articulation Information

- CSU Transferable
- UC Transferable

## Methods of Evaluation

- Classroom Discussions
  - Example: Students will participate in a group discussion on animal rights versus animal welfare. This discussion will include comparing and contrasting and/or debating various points of view while relating them to current animal management protocols. Students will be evaluated based on participation and incorporating course content.
- Objective Examinations
  - Example: Example Questions: Propose a hypothesis of your own and explain how you would test it. To receive full credit, students should employ the scientific method to design an experiment to test their hypothesis. Mitochondria a. The most obvious organelle in any eukaryotic cell. It is a membrane-bound organelle and is surrounded by a double membrane. It contains DNA. b. Provides the energy a cell needs to move, divide, produce secretory products, contract - in short, they are the power centers of the cell. c. A double layer of lipids (phospholipid bilayer) but is made quite complex by the presence of numerous proteins that are important to cell activity. These proteins include receptors, pores, and enzymes. It is responsible for the controlled entry and exit of ions in and out of the cell like sodium (Na) potassium (K), calcium (Ca<sup>++</sup>). d. A membrane-bound structure with a single membrane. It is actually a stack of membrane-bound vesicles that are important in packaging macromolecules for transport elsewhere in the cell. e. None of the above Sex-linked inheritance a. Traits that appear in the phenotype of only one sex b. Traits due to genes carried on autosomes; gene is dominant in one sex and recessive in the other c. Traits coded for by genes carried on the nonhomologous portion of the X chromosome d. None of the above
- Reports
  - Example: Scientific Paper Assignment (Journal of Animal Science Format) Purpose: The purpose of this assignment is to familiarize students with experimental methodology and interpretation. Writing style, grammar, and sentence structure will be evaluated. Method: A hypothesis will be provided to the class for discussion. From this hypothesis, students will develop an experimental design that will serve to test this experiment in the absence of environmental or genetic variables that may alter or bias the data. Over the course of several weeks students will participate in every aspect of the experiment, including 1) implementation of experimental protocol; 2) collection of research data; 3) summary, analysis and interpretation of research data; 4) development of a scientific paper in journal format. Paper will be assessed based upon correct use of research paper format and a rubric developed by the instructor and shared with students.
- Skill Demonstrations
  - Example: Students will demonstrate how to properly restrain a sheep after an instructor demonstration. Students will be evaluated on proper technique for animal and human safety.

## Repeatable

No

## Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. Instructor will facilitate the design and implementation of a growth study on two breeds of chickens applying the scientific method beginning with formulating a hypothesis. Students will read related research and incorporate it into a write up of the results in the Journal of Animal Science format reporting the data collected in the experiment. They will also evaluate the data and develop conclusions. Lecture Objectives: 3, 4, 5, 15 Laboratory Objectives: 1, 4

Lecture:

1. Instructor will present a lecture using projected images and handouts containing due dates, topics, learning outcomes and informational web sites to present the concepts used to synchronize bovine estrous. Students will be provided various scenarios and determine the most appropriate estrous synchronization methods. Lecture Objectives: 9, 10, 11, 15, 16

Distance Learning

1. Instructor will oversee and facilitate a student discussion on animal rights versus animal welfare. Discussion will include comparing and contrasting and/or debating various points of view while relating them to current animal management protocols. Lecture Objectives: 3, 14, 15, 16, 17

## Typical Out of Class Assignments Reading Assignments

1. Read the assigned pages from the textbook and be prepared to discuss the differences in the phases of mitosis; illustrate these differences by using models as well as diagramming them.
2. Read current scientific articles regarding animal science and be prepared to discuss them as well as use the data presented in them for other assignments. For example, read articles from peer-reviewed journals regarding rate of gain in various breeds of chickens and incorporate the data into a scientific paper written in the Journal of Animal Science format reporting the findings of the class research project (which in this case would be looking at rate of gain in various breeds of chickens).

## Writing, Problem Solving or Performance

1. Do a series of one page reports on diseases, nutritional deficiencies and supplements, reproductive technology and other facets of animal science.
2. Write a paper on an issue facing animal agriculture. Potential topics include biotechnology, animal waste, and animal welfare.

## Other (Term projects, research papers, portfolios, etc.)

1. Maintain a laboratory notebook containing data, observations, calculations, and other information pertinent to the laboratory portion of the course.

## Required Materials

- Animal Sciences
  - Author: Campbell, Kenealy & Campbell
  - Publisher: McGraw Hill
  - Publication Date: 2010
  - Text Edition: 4th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Introduction to Animal Science
  - Author: Damron
  - Publisher: Prentice Hall
  - Publication Date: 2017
  - Text Edition: 6th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Scientific Farm Animal Production
  - Author: Taylor
  - Publisher: Prentice Hall
  - Publication Date: 2015
  - Text Edition: 11th
  - Classic Textbook?: No
  - OER Link:
  - OER:

**Other materials and-or supplies required of students that contribute to the cost of the course.**