BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

BIOL 11 - Zoology **5 Unit(s)**

Prerequisite(s): Math Level V
Recommended Prep: Reading Level IV; English Level IV
Transfer Status: CSU/UC
51 hours Lecture
102 hours Lab

This course is intended for majors, and includes a survey of animal phyla and non-photosynthetic, single-celled, eukaryotic taxa. It covers the comparative structure, function, and life cycles of animals, as well as principles of evolution, taxonomy, and systematics. Topics include development, morphology and physiology, phylogeny, and behavior of animals, as well as principles of evolution, mechanisms of evolutionary change, and speciation. (C-ID BIOL 150).

II. **OBJECTIVES**

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

A. Recognize characteristics of major animal taxa.
B. Understand the phylogenetic relationships among major animal taxa.
C. Construct and interpret phylogenies
D. Identify and describe structures in animals from a variety of phyla and relate them to their functions, including nutrient acquisition, circulation, respiration, movement, nervous and sensory function, and reproduction.
E. Illustrate and exemplify physiological functions across the animal phyla.
F. Compare and contrast anatomical and physiological features of selected animal phyla
G. Understand and compare different patterns of animal development and life cycles of animals and non-photosynthetic, single-celled, eukaryotic taxa.
H. Identify examples of animal behavior and explain the evolutionary significance of particular behaviors
I. Describe the development, evolutionary origins and modifications of representative structures.
J. Describe the significance of sexual reproduction.
K. Describe the origin of multicellularity.
L. Describe mechanisms of evolutionary change, including speciation.
M. Provide evidence for evolution.
N. Acquire, use, and cite scientific literature appropriately in scientific writing.
O. Apply scientific methodology and reasoning through active experimentation, investigations, or other activities.
P. Demonstrate critical thinking/scientific reasoning skills.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Overview of tree of life and position of Animalia and non-photosynthetic, single-celled, eukaryotic taxa	4.25
2. Survey of animal phyla	4.25

3. Animal Systems Structure: a. Anatomy	4.25
4. Animal Systems Function: a. Physiology	4.25
5. Development and Life Cycles of representative animals and non-photosynthetic, single-celled, eukaryotic taxa	4.25
6. Animal Behavior	4.25
7. Phylogeny/Evolutionary History of Animal Taxa	4.25
8. Systematics and Taxonomy: a. Classification schemes	4.25
9. Study of how animal structures are related to their development, evolutionary origins, and modification	4.25
10. Mechanisms of Evolutionary Change: a. Natural Selection b. Genetic Drift c. Gene Flow d. Mutation e. Nonrandom Mating	4.25
11. Principles of Population Genetics	4.25
12. Speciation and Extinction	4.25
Total Hours	51.00

Lab

Topics	Hours
1. Introduction to the scientific method and experimental design	15.00
2. Use of investigative activities to explore course topics	15.00
3. Microscopic examination, observation, or dissections of representative organisms from animal and non-photosynthetic, single-celled, eukaryotic taxa	15.00
4. Comparative study of functional morphology, physiology, and behavior of representative organisms from major animal taxa	15.00
5. Comparative study of developmental stages and life cycles of representative organisms from animal and non-photosynthetic, single-celled, eukaryotic taxa	15.00
6. Exercises to illustrate how taxonomic classification schemes are established for animal and non-photosynthetic protist taxa	15.00
7. Exercises to explore mechanisms of evolutionary change	12.00
Total Hours	102.00

IV. **METHODS OF INSTRUCTION**

A. Lecture
B. Field Trips
C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
D. Discussion
E. Reading Assignments

F. Laboratory Experiments

V. METHODS OF EVALUATION

A. Exams/Tests
B. Quizzes
C. Written Assignments
D. Midterm and final examinations that include a written component which requires students to effectively communicate comprehension of material presented and critical thinking skills
E. Laboratory practical exams
F. Scientific paper and book discussions.

VI. EXAMPLES OF ASSIGNMENTS

A. Reading Assignments
   1. Read the textbook section discussing the size of Drosophila sperm. There will be an in-class discussion of the evolutionary implications for a species to have such large sperm cells.
   2. Read the provided handout on avian respiratory systems. Be prepared to discuss how this is adaptive for birds, and why it has not evolved in other vertebrates.

B. Writing Assignments
   1. Read the assigned paper on C. elegans, and in 1 page, summarize the following:
      • Describe the stages development.
      • What physical (morphological) differences were observed?
   2. Read the assigned research paper and answer the following questions in a 1 page summary:
      What is the primary question of this research?
      What was the researchers primary finding?
      Why is this finding significant?

C. Out-of-Class Assignments
   1. Visit the provided Bat Conference Website. Choose a topic and write a 1 paragraph description of why that topic is interesting and what questions it raises.
   2. Choose a mammal species from the provided Fish & Wildlife Website.
      • Write a 1-2 page report that addresses the following two questions:
      • What factors determine the distribution of this species?
      • Examining the distribution, what factors may be important in maintaining the genetic diversity of the species in California?

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. Raven, et al. Biology. 10th Edition. McGraw Hill, 2014.
B. Mistry, S. Lab handouts. 1st Edition. Butte College, 2010.

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