Las Positas College
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Course Outline for ZOOL 1

GENERAL ZOOLOGY

Effective: Spring 2010

I. CATALOG DESCRIPTION:
ZOOL 1 — GENERAL ZOOLOGY — 5.00 units

Major groups of organisms from Protista and Animalia kingdoms with emphasis on the evolution of form and function and their relationship to behavior and ecology. Laboratory dissection and observation of anatomy with correlative studies in animal behavior in the laboratory and field. Designed for majors in biology, zoology, wildlife management and related fields.

3.00 Units Lecture 2.00 Units Lab

Prerequisite
MATH 55 - Intermediate Algebra for STEM
or

MATH 55B - Intermediate Algebra for STEM B
or

MATH 55Y - Intermediate Algebra
or

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Strongly Recommended
BIO 30 - Intro to College Biology

Grading Methods:
Letter Grade

Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	108.00
Total Hours:	162.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. MATH55
B. MATH55B
C. MATH55Y

Before entering this course, it is strongly recommended that the student should be able to:

A. BIO30

IV. MEASURABLE OBJECTIVES:

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

A. describe and use classification systems used for protists and animals; explain what evidence is used to develop classification and taxonomic groups; compare and explain the 5-kingdom and 3-domain systems of classification, explain and demonstrate the application of phylogenetic systematics and cladistic analysis; distinguish among monophyletic, paraphyletic, and polyphyletic groupings;
B. describe typical eukaryotic and animal cells, including the structure and function of organelles; recognize and explain the structure and function of the different types of animal tissues;
C. explain diffusion, osmosis, and osmoregulation; explain the importance of osmoregulation to organisms;
D. explain the major developmental stages in a variety of animals; discuss and compare different ways that developmental processes are regulated and organized; recognize different stages of development in microscopic analysis;

E. compare and explain the significance of different body plans throughout taxonomic groups; explain characteristics of and differences in symmetry, tissue and germ layer organization, explain the structure and significance of the coelom; compare the presence or absence of a coelom among different taxa, explain and compare protostomate and deuterostomate development; describe characteristics of metameric organization;
F. explain concepts of animal behavior, including causation, learned and instinctive behavior, ethology, and behavioral ecology; perform an ethological study on an animal;
G. explain concepts of animal ecology, including population and community ecology, including representative relationships among taxa;
H. correctly identify and describe distinguishing features of organisms of the major taxa in Kingdom Protista and Kingdom Animalia; describe, compare, and contrast their diversity, basic evolutionary history, behavior, ecology, and development;
I. explain, compare, and contrast anatomy and physiological systems among different taxa, including circulatory, digestive, respiratory, and excretory systems;
J. explain structure, function, and significance of the amniotic egg;
K. summarize the evolutionary relationships among different taxonomic groups; explain the principles of natural selection;
L. demonstrate various laboratory skills and techniques including dissection and microscopic examination;
M. collect, identify taxonomic order, and properly prepare an insect collection; be able to correctly identify major insect orders.

V. CONTENT:
A. Lecture:
1. Taxonomy and Systematics
a. Classification systems
b. Taxonomic hierarchy
c. 3 domain system
d. Phylogenetic systematics and cladisitic analysis
2. Animal cells and tissues
a. Eukaryotic cell structure
b. Animal tissues
3. Diffusion and Osmosis
a. Diffusion
b. Osmosis
c. Osmoregulation
4. Development
a. Fertilization, cleavage, gastrulation, organogenesis, morphogenesis
b. Organization and regulation of development
5. Animal Structure and Function
a. Animal Body Plans
b. Symmetry
c. Tissue and germ layer organization
d. Presence/absence, structure, and function of coelom
e. Protostomate and deuterostomate development
f. Metamerism
6. Animal Behavior
a. Ethology
b. Causation
c. Instinctive and Learned Behavior
d. Behavioral ecology
7. Animal Ecology
a. Population ecology
b. Community ecology
c. Representative relationships among taxa
8. Identification, classification and taxonomy, diversity, basic evolutionary history, behavior, ecology, and development of major taxa within Kingdom Protista and Kingdom Animalia
9. Comparative anatomy and physiology of major taxa within Kingdom Protista and Kingdom Animalia
a. Circulatory system
b. Excretory system
c. Respiratory system
d. Digestive system
e. Amniotic egg
10. Evolutionary concepts
a. Natural selection
b. Evolutionary relationships among Protista and Animalia taxa
B. Laboratory:
1. Microscopy
2. Animal Cells and Tissues
3. Development
4. Classification and diversity; microscopic and macroscopic studies of live, preserved, and microscopic slides, dissections (if appropriate) of the major taxa within Kingdom Protista and Kingdom Animalia
5. Population Growth Experiment and /or Insect Collection
6. Field studies of diverse habitats, including aquatic stream study and marine intertidal zone

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Discussion** -
C. Laboratory exercises
D. Laboratory experiments
E. Articles from scientific literature
F. Student projects
G. **Audio-visual Activity** -
H. **Guest Lecturers** -
I. Field exercises

VII. TYPICAL ASSIGNMENTS:
A. Make appropriately prepared, labeled and referenced insect collection of 20 adult insects, with a maximum of three species per order.
B. Properly dissect, sketch, and label an Ascaris.
C. Conduct field study comparing aquatic stream animal diversity and composition in riffles versus pools.

VIII. EVALUATION:
A. **Methods**

B. **Frequency**

1. Quizzes, as appropriate; 3 to 4 midterms; and one final exam
2. Laboratory reports as appropriate
3. 15 to 20 Laboratory notebook checks (may be bundled together)
4. 3 to 4 Laboratory practical examinations
5. 2 to 5 field trip assignments
6. 1 to 3 student projects per semester (e.g., ethological study, insect collection, population growth experiment)

IX. TYPICAL TEXTS:

1. Miller, Stephen A., and John P. Harley *Zoology.* 8th ed., McGraw Hill, 2009.
2. Hickman, Cleveland P., Jr., Larry S. Roberts, Allan Larson, and Helen l'Anson, *Integrated Principles of Zoology.* 14th ed., McGraw Hill, 2008.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Lab Manual
B. Photo Atlas
C. Custom package(s)
D. Gloves
E. Lab coat