Las Positas College
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Course Outline for BIO 1B

GENERAL ZOOLOGY

Effective: Fall 2019

I. CATALOG DESCRIPTION:
BIO 1B — GENERAL ZOOLOGY — 5.00 units

Major groups of animal phyla and heterotrophic unicellular eukaryotes. Topics include comparative structure and function, development, ecology, taxonomy, phylogeny, evolution, and behavior. Designed for majors in biological sciences and related fields.

3.00 Units Lecture 2.00 Units Lab

Prerequisite
MATH 55 - Intermediate Algebra for BSTEM
with a minimum grade of C
or

MATH 55B - Intermediate Algebra for STEM B
with a minimum grade of C
or

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Strongly Recommended
BIO 30 - Introduction to College Biology
with a minimum grade of C

Grading Methods:
Letter Grade

Discipline:
- Biological Sciences

	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
1. Recognize and determine the distinctions between relations and functions, numerically, graphically, symbolically, and verbally;
2. Given a function, determine the domain and range and express them in interval notation;
3. Develop and use equations or function models to analyze and solve applied problems involving linear, quadratic, rational, radical, exponential or logarithmic expressions. Topics should minimally include growth, decay, geometry, optimization and uniform motion.
4. Solve compound inequalities, sketch the graph of the solution and use appropriate set and interval notation to express the solution;
5. Solve absolute value equations and inequalities and, where appropriate, sketch the graph of the solution and use set or interval notation to express the solution;
6. Sketch the graphs of nonlinear relations, including parabolas and circles, and identify key components of the graphs;

B. MATH55B
1. Develop and use equations or function models to analyze and solve applied problems involving linear, quadratic, rational, radical, exponential or logarithmic expressions. Topics should minimally include growth, decay, geometry, optimization and uniform motion.
2. Sketch the graphs of nonlinear relations, including parabolas and circles, and identify key components of the graphs.

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

A. BIO30
    1. Describe and apply the scientific method and how it is used by scientists to further scientific knowledge
    2. Cite the characteristics and levels of organization exhibited by all living organisms
    3. Know the use of light microscope and dissecting scope
    4. Describe how cells/specialized cells are structured and function
    5. Describe/contrast, mitosis, and meiosis
    6. Describe structure, transmission and expression of genes
    7. Explain the Darwinian concept of evolution as modified by modern scientific knowledge
    8. Describe how the modern (binomial) system names and classifies organisms

IV. MEASURABLE OBJECTIVES:

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

A. Compare and contrast characteristics of major animal taxa
B. Explain, construct, and interpret phylogenies
C. Summarize the phylogenetic relationships among animal taxa
D. Explain diffusion and osmosis; explain and give examples of osmoregulation in different organisms
E. Give examples of physiological features among animal taxa, including digestive, respiratory, excretory systems, circulatory, muscular, nervous, and reproductive systems
F. Distinguish among and explain the structure and function of the different types of animal tissues
G. Identify and describe anatomical structures from representatives of different taxa, and relate the structures to their functions in digestion, respiration, excretion, circulation, movement, nervous control, and reproduction
H. Compare and contrast anatomy and physiology among different taxa, including digestive, respiratory, excretory systems, circulatory, muscular, nervous, and reproductive systems
I. Compare and contrast asexual and sexual reproduction
J. Discuss and compare developmental patterns among animal taxa and heterotrophic unicellular eukaryotes; provide examples of how development of structures is related to their evolutionary history
K. Describe origin and importance of multicellularity
L. Explain mechanisms of evolutionary change
M. Explain the evidence for evolution
N. Explain examples of animal behavior and relate behaviors to evolutionary significance
O. Properly use and care for compound and dissecting microscopes for microscopic examination of biological structures
P. Apply scientific methodology and critical thinking through experimentation and experiences
Q. Perform laboratory experiments in an efficient, safe, and purposeful manner
R. Keep a detailed, well-organized, and comprehensive lab notebook
S. Demonstrate proficiency with dissection and proper and safe care, use, and choice of dissection tools, including microscopic examination
T. Acquire, use, and properly cite scientific literature appropriately in scientific writing
U. Conduct a biology research project or experiment, and clearly convey the results using correct scientific format

V. CONTENT:

A. Systematics and Taxonomy
    1. Taxonomy and classification
    2. Phylogenetic and cladisitic analysis
    3. Tree of life
B. Animal tissues
C. Diffusion/osmosis/osmoregulation
D. Development
    1. Comparative development
    2. Organization and regulation of development
E. Animal Taxa
    1. Survey
    2. Comparative Animal Body Plans
    3. Comparative Animal Systems Structure
    4. Comparative Animal Systems Function
    5. Life Cycles
F. Animal Behavior
    1. Ethology
    2. Causation
    3. Instinctive and Learned Behavior
    4. Behavioral ecology
G. Diversity, phylogeny, and basic evolutionary history, and ecology of major animal taxa and relationship with heterotrophic unicellular eukaryotes
H. Evolutionary concepts
    1. Natural selection and mechanisms of evolutionary change
    2. Population genetics
    3. Speciation and extinction

VI. LAB CONTENT:

A. Lab Safety
B. Experimental design
C. Microscopy
D. Animal Tissues
E. Phylogenetics
F. Behavior
G. Microscopic and macroscopic studies of live, preserved, and microscopic slides, and/or dissections (if applicable) of the major animal taxa and heterotrophic unicellular eukaryotes
H. Insect collection
I. Field studies

VII. METHODS OF INSTRUCTION:

A. **Lab** - 90% of lab time is hands on
B. **Lecture** -
C. **Discussion** -
D. Laboratory exercises
E. Articles from scientific literature
F. Field exercises
G. Student projects

H. **Audio-visual Activity** -
I. **Guest Lecturers** -
J. Laboratory experiments

VIII. TYPICAL ASSIGNMENTS:
A. Collect, prepare, label and reference an insect collection of 20 adult insects, with a maximum of three species per order.
B. Properly dissect, sketch, and label an *Ascaris* worm.
C. Do an ethology for an animal.
D. Compare and contrast microscopic differences and functions of epithelial tissues.

IX. EVALUATION:
Methods/Frequency

A. Exams/Tests
Four per semester
B. Quizzes
Weekly
C. Research Projects
Independent research project
D. Field Trips
Two per semester
E. Lab Activities
Notebook and lab practicals

X. TYPICAL TEXTS:
1. Miller, Stephen , and John Harley. *Zoology*. 11th ed., McGraw Hill, 2019.
2. Hickman, Cleveland, Larry Roberts, Susan Keen, David Eisenhour, Allan Larson, and Helen l'Anson. *Integrated Principles of Zoology.* 17th ed., McGraw Hill, 2017.
3. Perry, J., and Morton, D.. Photo Atlas for Biology. Brooks/Cole Cengage , 1996.
4. Hickman, C., Roberts, L., Larson, A., & l'Anson, H.. Laboratory Studies in Integrated Principles of Zoology. McGraw-Hill , 2017.

XI. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Custom package(s)
B. PPE (personal protective equipment)