Las Positas College
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Course Outline for BIOL 10

INTRO TO THE SCIENCE OF BIOL

Effective: Fall 2010

I. CATALOG DESCRIPTION:
BIOL 10 — INTRO TO THE SCIENCE OF BIOL — 4.00 units

Basic principles of biology, dealing with the nature of living things, and the nature of scientific investigation and its bioethical impact in our modern world. Designed for non-majors in biology and biomedical sciences.

3.00 Units Lecture 1.00 Units Lab

Grading Methods:
Letter or P/NP

Discipline:

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

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

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

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

A. Describe the scientific method and how it is used by scientists to further scientific knowledge;
B. Cite the characteristics exhibited by all living things;
C. Describe how a cell is structured, and explain how it functions in terms of cell membrane phenomena, genetic control mechanisms and metabolism; list the various kinds of specialized cells, both plant and animal, describe each, and state their functions;
D. Describe sexual reproduction and germination of flowering plants;
E. Describe how a typical vertebrate animal develops from a fertilized egg to the adult form;
F. Describe the following vertebrate organ systems and list the principal functions of each: integumentary, skeletal, muscular, nervous, cardiovascular, respiratory, excretory, digestive, endocrine, reproductive;
G. Describe the modern (binomial) system of naming and classifying plants, animals and other organisms in the biosphere;
H. Define the terms ecology and conservation and differentiate between the two;
I. Describe the major environmental concerns of our modern world;
J. Explain the Darwinian concept of evolution, as modified by modern scientific knowledge.

V. CONTENT:

A. Scientific methods
    1. Definition
    2. Origin
    3. Applications
    4. Limitations
    5. Interdisciplinary relationships of science
B. Cell theory of life
    1. Historical development
    2. Characteristics of living things
C. Plants and animals
    1. Classification
    2. Structure
    3. Adaptation
    4. Behavior
D. Metabolism
    1. Autotrophic nutrition
    2. Heterotrophic nutrition
    3. Gas exchange
    4. Respiration
    5. Energy utilization
    6. Energy transfer
E. Control systems
    1. Hormones

2. Neural coordination
3. Growth factors
4. Genes

F. Growth, Development and Reproduction
1. Molecular reproduction
2. Cellular reproduction
3. Organismic reproduction
4. Sexuality
5. Cellular development
6. Organismic development
7. Cancer

G. Heredity
1. History
2. Mendelian genetics
3. Non-Mendelian inheritance
4. Population genetics

H. Evolution
1. History and evidence for evolution
2. Genetic basis of evolution
3. Characteristics of evolution
4. Origin and evolution of man

I. Ecology and conservation
1. Ecology and conservation compared
2. Principles of ecology
3. Contemporary issues in conservation of natural resources
4. Ecosystems and communities
5. Trophic levels, food chains and food webs
6. Invasive and endangered species

J. Molecular Biology
1. DNA structure and replication
2. Gene Expression and its control
3. Biotechnology

VI. METHODS OF INSTRUCTION:

A. **Lab** -
B. **Lecture** -
C. **Discussion** -
D. **Audio-visual Activity** -

VII. TYPICAL ASSIGNMENTS:

A. Quiz before labs B. Genetics worksheet

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Home Work
4. Lab Activities
5. Other:
    a. Methods
        1. Quizzes, midterm(s) and final examination
        2. Laboratory practicals

B. **Frequency**

1. Frequency
    a. Homework: approximately ever 2 weeks
    b. Testing
        1. Quizzes: approximately weekly
        2. Tests or midterm exams: A minimum of two per semester
        3. Final exam: 1
        4. Laboratory reports: 1– weekly

IX. TYPICAL TEXTS:

1. Starr, C; C.A. Evers; & L. Starr *Biology: Concepts and Applications.* 7th ed., Thomson – Brooks/Cole, 2008.
2. Dickey, J *Laboratory Investigations for Biology.* 2nd ed., Benjamin Cummings, 2003.

X. OTHER MATERIALS REQUIRED OF STUDENTS: