

Las Positas College
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Course Outline for BIO 10

INTRO TO THE SCIENCE OF BIOL

Effective: Fall 2015

I. CATALOG DESCRIPTION:

BIO 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. (Note: Formerly BIOL 10)

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. **Audio-visual Activity** -
- D. **Discussion** -

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. Quizzes, midterm(s) and final examination
 - b. Laboratory practicals

B. **Frequency**

- 1. Homework: approximately every 2 weeks
- 2. Testing
 - a. Quizzes: approximately weekly
 - b. Tests or midterm exams: A minimum of two per semester
 - c. Final exam: 1
 - d. 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: