



El Camino College

COURSE OUTLINE OF RECORD - Official

I. GENERAL COURSE INFORMATION

Subject and Number: Biology 10
Descriptive Title: Fundamentals of Biology

Course Disciplines: Biological Sciences

Division: Natural Sciences

Catalog Description: This course is a survey of all living things: prokaryotes, protists, fungi, plants, and animals. Basic principles of structure, function, and relationships of living organisms are discussed with special reference to humans.

Note: Students will not receive UC credit for Biology 10 if taken after Biology 101.

Conditions of Enrollment: Recommended Preparation

English 84

Course Length: Full Term Other (Specify number of weeks):

Hours Lecture: 3.00 hours per week TBA

Hours Laboratory: 3.00 hours per week TBA

Course Units: 4.00

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: Effective Date: Prior to July 1992

Transfer UC: Effective Date: Prior to July 1992

General Education:

El Camino College: 1 – Natural Sciences
Term: _____ Other: Approved

CSU GE: B2 - Life Science
Term: _____ Other: Approved

B3 - Laboratory Sciences
Term: _____ Other: Approved

IGETC: 5B - Biological Science with a Lab

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. The student will understand and apply principles of the scientific method by recognizing an idea based on reproducible evidence.
2. The student will be able to use the compound and dissecting microscopes to observe cells and microorganisms.
3. The student will be able to describe key activities at each stage of mitosis.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Describe the characteristics of life.
Other (specify)
Objective exams and essay questions
2. Define basic chemical terms and describe the molecules that make up living things.
Other (specify)
Objective exams and essay questions
3. Describe the anatomy of cells and relate cellular structures to their functions.
Essay exams
4. Describe the biochemical pathways involved in photosynthesis and cellular respiration.
Objective Exams
5. Identify and describe the phases of mitosis and meiosis.
Objective Exams
6. Solve genetic problems, such as mono- and dihybrid crosses, multiple alleles, sex-linked inheritance, and blending.
Objective Exams
7. Explain the structure of DNA and its role in protein synthesis.
Essay exams
8. Identify and describe genetic disorders caused by mutation and nondisjunction.
Objective Exams
9. Apply the principles of natural selection to predict outcomes of real or hypothetical examples.
Essay exams

10. Describe speciation and the evidence for common ancestry of life.

Objective Exams

11. Define basic ecological terms and relate populations, the environment, and man's impact on the environment.

Multiple Choice

12. Explain the Linnaean system of classification, the major taxa, and binomial nomenclature.

Multiple Choice

13. Identify the structural, functional, and ecological features that characterize the major groups of the prokaryotic, protist and fungi kingdoms.

Laboratory reports

14. Describe the major cells, tissues, and organs in higher plants and integrate the structure and function of each system.

Multiple Choice

15. Describe angiosperm reproduction: alternation of generations life cycle, and the structure of flowers, fruits, and seeds.

Objective Exams

16. Identify the major phyla of the Animal Kingdom, and describe the structural features which make each phylum unique.

Multiple Choice

17. Describe the organs and functions of vertebrate organ systems, with special emphasis on humans.

Essay exams

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	1	I	Introduction and Orientation A. Fields of Biology B. Characteristics of Life
Lecture	2	II	Chemical Basis of Life A. Atoms and Elements B. Molecules and Compounds
Lecture	2	III	Cells A. Cell Theory B. Cellular Basis of Life C. Organization of Life
Lecture	3	IV	Reproduction A. Mitosis and Meiosis B. Life Cycles and Asexual Reproduction
Lecture	5	V	Cell Physiology A. Homeostasis B. Membrane Transport C. Photosynthesis D. Enzymes E. Cellular Respiration

Lecture	1	VI	Taxonomy A. History B. Scope
Lecture	1	VII	Survey of Prokaryotes A. Definition B. Characteristics C. Examples
Lecture	1	VIII	Survey of Protists A. General characteristics 1. Modes of nutrition 2. Cell locomotion methods B. Examples
Lecture	1	IX	Survey of Fungi A. General characteristics 1. Method of obtaining nutrition 2. Reproductive strategies B. Examples
Lecture	7	X	Plant A. Anatomy B. Physiology C. Reproduction
Lecture	3	XI	Survey of Lower Invertebrates A. General characteristics B. Examples
Lecture	3	XII	Survey of Higher Invertebrates A. General characteristics B. Examples
Lecture	3	XIII	Survey of Chordates A. General characteristics B. Examples
Lecture	8	XIV	Animal Organ Systems A. Anatomy B. Physiology C. Emphasis on Humans
Lecture	6	XV	Genetics A. Mendelian Genetics B. DNA C. Molecular Genetics D. Mutation E. Chromosomal Aberrations
Lecture	2	XVI	Evolution A. Natural Selection B. Theories of Macroevolution
Lecture	5	XVII	Ecology A. Principles B. Application
Lab	54	XVIII	LABORATORY TOPICS: Select 13 or more experiments/exercises, including all starred required ones. The starred laboratories must be completed during the semester. A. Use of Microscope* B. Representative Prokaryotic and Eukaryotic cells* C. Mitosis and Meiosis* D. Cell Physiology: Diffusion and Osmosis*

		E. Cell Physiology: Photosynthesis, Cell Respiration and Fermentation* F. Survey of Bacteria, Protists and Fungi* G. Survey of Seedless Plants and Gymnosperms* H. Structure of Angiosperms: Stems, Roots and Leaves* I. Structure of Angiosperms: Flower, Seed and Fruit* J. Survey of Lower Invertebrates: Sponges, Cnidarians, Flatworms, Roundworms* K. Survey of Higher Invertebrates: Annelids, Mollusks, Arthropods, Echinoderms* L. Survey of Chordates* M. Genetics Problem Solving* N. Embryology and Human Histology O. Evolution and Natural Selection P. Human Physiology Q. Enzymes R. Ecology S. DNA Technology T. Scientific Method U. Lab Practicum
Total Lecture Hours	54	
Total Laboratory Hours	54	
Total Hours	108	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Select and attend a natural wildlife habitat from the approved class list. Compile a list of representative wildlife that you observed. Write a few sentences on the ecology of the specific habitat that you visited.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Color blindness is a sex-linked trait. A woman with normal vision whose father was color blind marries a man with normal vision. What is the probability that a son will be color blind? What is the probability that a daughter will be color blind? Show your work to support your answer.
2. Determine and identify arthropod anatomical features upon examination of characteristic samples of arthropod animals provided in the lab.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Other exams
Quizzes

Homework Problems

Term or other papers

Multiple Choice

Completion

Matching Items

True/False

Other (specify):

Laboratory exercises utilizing a compound and dissecting microscope to recognize cells, tissues, and organisms.

V. INSTRUCTIONAL METHODS

Laboratory

Lecture

Multimedia presentations

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study

Answer questions

Required reading

Problem solving activities

Written work

Journal

Observation of or participation in an activity related to course content

Estimated Independent Study Hours per Week: 6

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Anu Singh-Cundy and Gary Shin. Discover Biology. 6th ed. W. W. Norton & Company, 2014.

Freeman, Nancy and ECC Biology Faculty. Biology 10 Laboratory Manual. 4th ed. Bluedoor, 2012.

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT**A. Requisites (Course and Non-Course Prerequisites and Corequisites)**

Requisites	Category and Justification
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B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation English-84	

D. Recommended Skills

Recommended Skills
Students should be able to read and interpret the major topics in a textbook. ENGL 84 - Select and employ reading strategies to interpret the content of a college-level textbook, with special focus on constructing a thesis statement and providing valid support.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by R. Brown, J. Oyama, A. Porter on 09/01/1978.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 11/20/2017

Last Reviewed and/or Revised by Katherine Marsh on 04/05/2016