El Camino College

COURSE OUTLINE OF RECORD - Official

I. GENERAL COURSE INFORMATION

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

Course Disciplines: Biological Sciences

Division: Natural Sciences

Catalog Description: This honors course is designed for students in the Honors Transfer Program. 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. This course is enriched through writing assignments that involve research and analysis.
Note: Students may take either Biology 10 or Biology 10H. Duplicate credit will not be awarded for Biology 10 and Biology 10H.

Conditions of Enrollment: **Recommended Preparation**
eligibility for English 1A

Course Length: [X] 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: [X] Effective Date: 10/19/2015
Transfer UC: [X] Effective Date: Proposed

General Education:

El Camino College: **1 – Natural Sciences**
Term: Fall 2016 Other:

CSU GE: **B2 - Life Science**
Term: Other:
B3 - Laboratory Sciences
Term: Other:

IGETC:

5B - Biological Science with a Lab

Term: Other:

5C - Science Laboratory

Term: Other:

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; recognizing an idea based on reproducible evidence. Honors students will design a novel experiment, gather evidence and use scholarly research to support the explanation of the results.
2. The student will be able to use the compound and dissecting microscope 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 questions 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 monohybrid 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 population, 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 and Scientific Process B. Characteristics of Life
Lecture	2	II	Chemical Basis of Life A. Atoms and Elements B. Molecules and Compunds
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 Protista A. General characteristics B. Examples
Lecture	1	IX	Survey of Fungi A. General characteristics B. Examples
Lecture	7	X	Plants 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. Applications
Lab	54	XVIII	Laboratory Topics: Select 13 or more experiments or exercises, including all the starred ones. The starred laboratories must be completed during the semester. A. Using the Microscope* B. Observing Cells; Prokaryotic and Eukaryotic Representatives* C. Mitosis and Meiosis* D. Cell Physiology: Diffusion and Osmosis

			E. Cell Physiology: Photosynthesis, Cell Respiration and Fermentation* F. Survey of Bacteria, Protista and Fungi* G. Survey of Seedless Plants and Gymnosperms* H. Structure of Angiosperms: Stems, Roots, and Leaves* I. Structure of Angiosperms: Flowers, Fruits, and Seeds* J. Survey of Lower Invertebrates: Sponges, Cnidarians, Flatworms, and 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 an essay 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 probablility that a son will be color blind? What is the probablility that a daughter will be color blind? Show your work to support your answer.
2. Research and analyze in a two to three paragraph essay arthropod anatomical features upon examination of characteristic samples of arthropod animals provided in lab.

D. **OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:**

Essay exams

Objective Exams

Quizzes

Written homework

Laboratory reports

Homework Problems

Term or other papers

Multiple Choice

Completion

Matching Items

V. INSTRUCTIONAL METHODS

Group Activities
Laboratory
Lecture
Multimedia presentations
Simulation

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
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 Michael Cain . Discover Biology. 5th ed. Norton, W.W. and Company, Inc., 2012.
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

B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Non-Course Recommended Preparation eligibility for English 1A	It is advised that students be able to read and effectively analyze college level texts, and be able to write a paper that persuasively proves an original thesis.

D. Recommended Skills

Recommended Skills
Students with college level reading and writing skills will have more success in passing this class. ENGL A - Read and apply critical thinking skills to college-level expository prose for the purposes of writing and discussion.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. ENGL A - Plan, write, and revise 500-word multi-paragraph expository essays including an introduction and conclusion, exhibiting coherence and unity, avoiding major grammatical and mechanical errors that interfere with meaning, and demonstrating awareness of audience, purpose, and language choice.ENGL 84 - Interpret a book-length work through discussion, journal writing, or composition writing.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by Thanh-Thuy Bui on 03/04/2015.

BOARD APPROVAL DATE: 10/19/2015

LAST BOARD APPROVAL DATE:

Last Reviewed and/or Revised by Thanh-Thuy Bui on 03/04/2015

18984