

**EL CAMINO COLLEGE**  
**COURSE OUTLINE OF RECORD - Approved**

<b>Subject:</b>	BIOL
<b>Course Number:</b>	120H
<b>Descriptive Title:</b>	Honors Ecology, Evolution, Diversity, and Physiology
<b>Division:</b>	Natural Sciences
<b>Department:</b>	Biology
<b>Course Disciplines:</b>	Biological Sciences
<b>Catalog Description:</b>	<p>This honors course, intended for students in the Honors Transfer Program, is a survey of eukaryotic organisms, their evolution and ecology. The student will have a thorough exposure to plant and animal anatomy and physiology, and will utilize animal dissection in the lab. Students will be expected to complete a project that includes hypothesis, prediction, experimentation, and presentation of results. This course is one of three courses in the biology series designed for biology majors, including those students planning to pursue a career in medicine, dentistry, or other life sciences. This course is enriched through extensive rigorous reading, writing, and research assignments.</p> <p>Note: Students may take either Biology 120 or Biology 120H. Duplicate credit will not be awarded for Biology 120 and Biology 120H.</p>
<b>Prerequisite:</b>	Chemistry 4 or Chemistry 4H with a minimum grade of C in prerequisite or equivalent
<b>Recommended Preparation:</b>	Biology 110 or Biology 110H and English 1 or eligibility for English 1A or qualification by appropriate assessment.
<b>Course Length:</b>	Full Term
<b>Hours Lecture (per week):</b>	3
<b>Hours Laboratory (per week):</b>	6
<b>Outside Study Hours:</b>	6
<b>Total Course Hours:</b>	162
<b>Course Units:</b>	5
<b>Grading Method:</b>	Letter Grade only
<b>Credit Status:</b>	Credit, degree applicable
<b>Transfer CSU:</b>	Yes
<b>Effective Date:</b>	12/19/2016
<b>Transfer UC:</b>	Yes
<b>Effective Date:</b>	
<b>General Education:</b> ECC	Area 1 - Natural Sciences
<b>Term:</b>	
<b>Other:</b>	

<b>CSU GE:</b>	Area B2 - Physical Universe and its Life Forms: Life Science, Area B3 - Physical Universe and its Life Forms: Laboratory Activity
<b>Term:</b>	
<b>Other:</b>	
<b>IGETC:</b>	Area 5B - Biological Science, Area 5C - course that incorporate a laboratory
<b>Term:</b>	
<b>Other:</b>	
<b>Student Learning Outcomes:</b>	<p><b>SLO #1 Scientific Method</b> The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.</p> <p><b>SLO #2 Use of Microscope</b> The student will be able to use the compound and dissecting microscope to observe cells and microorganisms.</p> <p><b>SLO #3 Content Knowledge (Energy Flow)</b> Students will use basic energy principles to explain the flow of energy in living systems, such as those that occur in the cellular metabolic pathways of photosynthesis and cell respiration, or the relationships observed between autotrophs and heterotrophs in ecosystems.</p>
<b>Course Objectives:</b>	<ol style="list-style-type: none"> <li>1. Characterize interactions among organisms and between organisms and environment.</li> <li>2. Discriminate among population dynamics, community structure and ecosystem functions.</li> <li>3. Outline major events in the evolutionary history of life.</li> <li>4. Explain the principles and mechanisms of evolution at the micro and macro levels.</li> <li>5. Compare and contrast representative phyla of supergroups of Eukarya (formerly protists).</li> <li>6. Recognize the various protist, fungal, plant, and animal phyla viewed in the lab.</li> <li>7. Compare and contrast the life cycles of the fungal divisions.</li> <li>8. Diagram and explain the alternation of generations in the life cycle of plants.</li> <li>9. Identify samples of flower, fruit, and seed types.</li> <li>10. Describe the various plant tissues and organs.</li> <li>11. Explain water and food transport in plants.</li> <li>12. Discuss the role of phytohormones in plant growth.</li> <li>13. Identify and describe animal structures and relate them to functions.</li> </ol>
<b>Major Topics:</b>	<p><b>I. Evolution (6 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. History of Life</li> <li>B. Natural Selection</li> <li>C. Systematics and Phylogeny</li> </ol> <p><b>II. Ecology (10 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Populations and communities</li> <li>B. Energy flow and natural resources <ol style="list-style-type: none"> <li>1. Carbon Cycle</li> <li>2. Nitrogen Cycle</li> </ol> </li> </ol>

- 3. Water Cycle
- 4. Other nutrients
- C. Biomes
- D. Pollution

### **III. "Protists" (4 hours, lecture)**

- A. Supergroups within Eukarya
  - 1. Diplomonads
  - 2. Archaeplastida
  - 3. Opisthokonta

### **IV. Fungi (4 hours, lecture)**

- A. Evolution
- B. Ecological variances
- C. Life cycles
- D. Spore types
- E. Reproduction

### **V. Plants (14 hours, lecture)**

- A. Non-vascular and Seedless Plants
  - 1. Liverworts
  - 2. Hornworts
  - 3. Mosses
- B. Vascular Seedless Plants
  - 1. *Selaginella*, Quillworts, and other Lycopods
  - 2. Ferns and Their Allies
- C. Seed Plant Diversity, Ecology, and Reproduction
  - 1. Cycadophyta
  - 2. Ginkgophyta
  - 3. Pinophyta
  - 4. Gnetophyta
  - 5. Anthophyta (Angiosperms)
- D. Angiosperm Anatomy
- E. Angiosperm Physiology

### **VI. Animals (16 hours, lecture)**

- A. Animal Tissues
  - 1. Ectoderm
  - 2. Mesoderm
  - 3. Endoderm
- B. Animal Organ Systems
  - 1. Skin/Integument
  - 2. Cardiovascular
  - 3. Respiratory
  - 4. Skeletal
  - 5. Reproductive
  - 6. Excretory
  - 7. Digestive
  - 8. Endocrine
  - 9. Muscle
  - 10. Nervous

**A minimum of 80% of lab activities are hands-on experiences**

**VII. Microscope (4 hours, lab)**

- A. Compound Microscope
  - 1. Letter "e"
  - 2. Silk fiber Slide
- B. Dissecting Microscope

**VIII. Research Methods (8 hours, lab)**

- A. Strategy
- B. Research Projects
- C. Data
- D. Preliminary Reports
- E. Group Projects

**IX. Ecology (14 hours, lab)**

**X. Protists and Supergroups (7 hours, lab)**

- A. Diplomonads
- B. Alveolata
- C. Ciliata
- D. Amoebozoa
- E. Archaeplastida
- F. Opisthokonta

**XI. Fungi (7 hours, lab)**

- A. Ascomycota
- B. Zygomycota
- C. Chytridiomycota
- D. Glomeromycota
- E. Basidiomycota
- F. Lichens
- G. Mycorrhizal Assemblages

**XII. Plants (28 hours, lab)**

- A. Seed Plants
- B. Plant anatomy
- C. Plant physiology
- D. Plant hormones
- E. Stimuli response
- F. Phytochemistry

**XIII. Animals (40 hours, lab)**

- A. Diversity of phyla and diploblastic or triploblastic tissue types.
- B. Phylum overview (9 -15 phyla)
- C. Phylum Porifera
- D. Phylum Cnidaria
- E. Phylum Platyhelminthes
- F. Phylum Nematoda
- G. Phylum Annelida
- H. Phylum Mollusca
- I. Phylum Arthropoda

	<p>J. Phylum Echinodermata</p> <p>K. Phylum Hemichordata</p> <p>L. Phylum Chordata</p>
<b>Total Lecture Hours:</b>	54
<b>Total Laboratory Hours:</b>	108
<b>Total Hours:</b>	162
<b>Primary Method of Evaluation:</b>	2) Problem solving demonstrations (computational or non-computational)
<b>Typical Assignment Using Primary Method of Evaluation:</b>	<p>Identify the role of producers various consumers and decomposers in terrestrial and aquatic ecosystems.</p> <p>Write a 1-2 page paper with a minimum of 2 primary sources.</p>
<b>Critical Thinking Assignment 1:</b>	<p>Use lecture and laboratory to develop knowledge of evolutionary trends and comparative anatomy, such as among the two, three, or four chambered heart designs in vertebrate animals.</p> <p>Compare and contrast organ development and function in immature and adult stage of Amphibia and Mammals, particularly through dissection of frogs and fetal pigs.</p> <p>Write a 1-2 page paper with a minimum of 2 primary sources.</p>
<b>Critical Thinking Assignment 2:</b>	<p>Use the Natural Selection mechanism to help understand and explain the support of Evolution as a theory; use case study examples to provide support of Evolution and refute claims of "Darwin's Critics" in textbooks and/or supplemental handouts.</p> <ol style="list-style-type: none"> <li>1. Write a minimum 3 page paper with a minimum of 3 primary sources.</li> <li>2. Perform other examples of reading peer-reviewed journals, analyzing data, and short papers to synthesize conclusions.</li> </ol>
<b>Other Evaluation Methods:</b>	Completion, Embedded Questions, Essay Exams, Fieldwork, Homework Problems, Laboratory Reports, Matching Items, Multiple Choice, Objective Exam, Quizzes, Reading Reports, Term or Other Papers, True/False, Written Homework
<b>Instructional Methods:</b>	Demonstration, Discussion, Field trips, Group Activities, Lab, Lecture, Multimedia presentations
<b>If other:</b>	Internet Presentation/Resources
<b>Work Outside of Class:</b>	Answer questions, Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting), Problem solving activity, Required reading, Study, Written work (such as essay/composition/report/analysis/research)
<b>If Other:</b>	Group laboratory project
<b>Up-To-Date Representative Textbooks:</b>	<p>Peter J. Russell; Paul E. Hertz; Beverly McMillan, <b>Biology: The Dynamic Science</b>, 5th ed. 2021</p> <p>Darrell Vodopich and Randy Moore, <b>Biology Laboratory Manual</b>, 12th Edition 2020</p>
<b>Alternative Textbooks:</b>	
<b>Required Supplementary Readings:</b>	

<b>Other Required Materials:</b>	
<b>Requisite:</b>	Prerequisite
<b>Category:</b>	standard
<b>Requisite course(s): List both prerequisites and corequisites in this box.</b>	Chemistry-4 or Chemistry-4H or
<b>Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	<p><b>Students will need to have a basic chemistry understanding.</b></p> <p>CHEM 4/CHEM 4H - Utilize the language of chemistry, including vocabulary, symbols, formulas, and equations.</p> <p>CHEM 4/CHEM 4H- Compare and contrast physical properties, physical changes, chemical properties, and chemical changes.</p>
<b>Requisite Skill:</b>	
<b>Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable</b>	
<b>Requisite course:</b>	Biology 110 or Biology 110H and English 1
<b>Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	<p><b>Ability to relate eukaryotic cellular structures with their functions.</b></p> <p>BIOL 110/110H - Demonstrate general knowledge of eukaryotic cell anatomy, gene expression, metabolism, and division, including Mendelian genetics.</p> <p><b>Provide an integrated overview and explain the importance of the flow of information from DNA to RNA to protein</b></p> <p>BIOL 110/110H Explain in detail the processes of transcription and translation in cells.</p> <p><b>It is advised that students are able to read and effectively analyze college level texts, and have the ability to write a paper that persuasively proves an original thesis. If students are eligible for English 1A they are more likely to be successful in this course.</b></p> <p><b>Students will have higher success if they can read and write at college level.</b></p> <p>ENGL 1- Summarize, analyze, evaluate, and synthesize college-level texts.</p> <p>ENGL 1 -Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.</p>
<b>Requisite Skill:</b>	or eligibility for English 1A or English 1AH or qualification by appropriate assessment
<b>Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable</b>	<p><b>It is advised that students are able to read and effectively analyze college level texts, and have the ability to write a paper that persuasively proves an original thesis. If students are eligible for English 1A they are more likely to be successful in this course.</b></p> <p><b>Students will have higher success if they can read and write at college level.</b></p> <p>Summarize, analyze, evaluate, and synthesize college-level texts.</p>

	Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.
<b>Enrollment Limitations and Category:</b>	
<b>Enrollment Limitations Impact:</b>	
<b>Course Created by:</b>	Thanh-Thuy Bui
<b>Date:</b>	12/10/2015
<b>Original Board Approval Date:</b>	12/19/2016
<b>Last Reviewed and/or Revised by:</b>	Karla Villatoro
<b>Date:</b>	11/18/2021
<b>Last Board Approval Date:</b>	01/18/2022