Cerro Coso College

Course Outline of Record Report

10/11/2021

BIOLC112 : General Biology II

General Information

Author:	• Claudia Sellers • Burch, Andrew • Ooi, Guck
Course Code (CB01) :	BIOLC112
Course Title (CB02) :	General Biology II
Department:	Science
Proposal Start:	Spring 2022
TOP Code (CB03) :	(0401.00) Biology, General
SAM Code (CB09) :	Non-occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000150246
Curriculum Committee Approval Date:	02/07/2014
Board of Trustees Approval Date:	03/06/2014
External Review Approval Date:	06/19/2014
Course Description:	This course is for students majoring in biological sciences and related subjects. It covers organism diversity and examines the basic principles governing evolution of organisms and their interactions with the environment. The course sequence includes evolutionary biology, phylogenetics, anatomy and physiology of plants, ecology, and the major taxa of protists, fungi, plants, and animals. BIOL C111 is not a prerequisite for BIOL C112.
Submission Type:	Mandatory Revision Cyclical review. Revisions to Course Description, update textbook, and streamlined SLO's. ENGL C101 is made as prerequisite. Added rationale to Methods of Instructions. Course was last assessed in Spring 2020, and has no impact on this revision.
Author:	No value

Faculty Minimum Qualifications

Master Discipline Preferred:	• Biological Sciences
Alternate Master Discipline Preferred:	• Biological Sciences
Bachelors or Associates Discipline Preferred:	No value
Additional Bachelors or Associates Discipline Preferred:	No value

Course Development Options

Basic Skills Status (CB08)	Course Special Class Status (CB13)	Grade Options

Course is not a basic skills course.

Course is not a special class.

- Letter Grade Methods
- Pass/No Pass

☐ Allow Students to Gain Credit by Exam/Challenge

Allowed Number of Retakes

0

Course Prior To College Level (CB21)

Not applicable.

Rationale For Credit By Exam/Challenge

No value

Retake Policy Description

Type:|Non-Repeatable Credit

☑ Allow Students To Audit Course

Course Support Course Status (CB26)

Course is not a support course

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
CC General Sciences	A.A. Degree Major	Spring 2018
CC Liberal Arts: Mathematics & Science	A.A. Degree Major	Summer 2018 to Fall 2020
CSU General Education (CSU GE Breadth) (In Development)	Certificate of Achievement	Fall 2021
Intersegmental General Education Transfer Curriculum Certificate of Achievement (In Development)	Certificate of Achievement	Fall 2021
CSU General Education (CSU GE Breadth)	Certificate of Achievement	Fall 2020
Intersegmental General Education Transfer Curriculum Certificate of Achievement	Certificate of Achievement	Fall 2020
Liberal Arts: Mathematics & Science Associate in Arts Degree	A.A. Degree Major	Fall 2020

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

Y

Transferability	Transferability Status
Transferable to both UC and CSU	Approved

Cerro Coso General Education Requirements	Categories	Status	Approval Date	Comparable Course
Area 1.1	Natural Science Life Sciences	Approved	No value	BIOL 130 S

CSU General Education Certification	Categories	Status	Approval Date	Comparable Course
Area B.2	Scientific Inquiry & Quantitative Reasoning Life Science	Approved	No value	BIOL 130 S
Area B.3	Scientific Inquiry & Quantitative Reasoning Laboratory	Approved	No value	

Intersegmental General Education Transfer Curriculum	Categories	Status	Approval Date	Comparable Course
Area 5.B	Physical & Biological Sciences Biological Science	Approved	No value	No Comparable Course defined.
Area 5.C	Physical & Biological Sciences Laboratory/Activity	Approved	No value	

C-ID	Categories	Status	Approval Date	Comparable Course
Biology	C-ID discipline	Pending	No value	BIOL 130 S

Units and Hours

Summary

Minimum Credit Units (CB07)	5
Maximum Credit Units (CB06)	5
Total Course In-Class (Contact) Hours	126
Total Course Out-of-Class Hours	144
Total Student Learning Hours	270
Faculty Load	0

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Status (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Classs
Lecture Hours	4	8
Laboratory Hours	3	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	72
Laboratory	54
Activity	0
Total	126
Course Out-of-Class Hours	
Lecture	144
Laboratory	0
Activity	0
Total	144

Time Commitment Notes for Students

No value

Faculty Load

Extra Duties: 0

Faculty Load: 0

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

MATHC055 - Intermediate Algebra (in-development)

The quantitative aspects of Biology such as population analysis, phylogenetic analysis, and Hardy-Weinberg equations, require college-level algebra to understand the concepts and significance of these measurements. Students will be required to interpret and comprehend the underlying equations that form the basis of these measurements. MATH C055 will provide the student with the requisite skills to meet these expectations.

MATH C055 requisite is required for transfer by CSU, UC and other four-year institutions.

AND

Prerequisite

ENGLC101 - Freshman Composition

Students in BIOL C112 must be able to read and comprehend a college-level Biology textbook which are usually written at a Gunning Fog Index of 13 to 14. They are expected to identify central points, both explicit and implied, outline and summarize complex and technical scientific readings, and interpret difficult and figurative language in academic discourse and scientific terminology. Students must also be able to write summaries of assigned readings from the course textbook, answer homework questions using paragraph-length responses, and answer essay questions in clear and error-free prose based on readings from various scientific texts. ENGL C101 provides the student with the requisite skills to meet these expectations. Relevant outcomes from ENGL C101 are:

- Read, analyze, and evaluate a variety of university-level texts for content, context, and rhetorical merit with consideration of tone, audience, and purpose.
- Develop varied and flexible strategies for generating, drafting, and revising essays.
- Evaluate the style of one's own writing and the writing of others and self-correct for greater clarity and directness.
- Write timed essays in class exhibiting acceptable college-level control of mechanics, organization, development, and coherence.
- Integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism.
- Proofread and edit essays for presentation so they exhibit no disruptive errors in English grammar, usage, or punctuation.

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Rationale	Classroom lecture using board-work and Powerpoint to explain material from the assigned textbook. Example: Origin of Life - The Miller-Urey experiment demonstrating that organic molecules can be synthesized spontaneously under conditions simulating primordial earth.

Methods of Instruction	Laboratory
Rationale	Group laboratory work to further explore important ideas. Individual reading of material in preparation to review and conduct laboratory experiments. Example: Students are asked to use genetic distances to construct a phylogenetic tree during lab class.

Methods of Instruction	Demonstration
Rationale	Proper laboratory techniques are demonstrated to ensure safe and correct lab procedures are followed. Example: Students are asked to complete the exercises in the handout " Biology for Life - Lab Safety Worksheet"

Assignments

Homework Assignments: Students are asked to assimilate the assigned reading material. Example: Read chapter 2. Student should read chapter two and assimilate material. Method of material assimilation is not prescribed. It is suggested that students outline chapters, answer study questions in the text, utilize on-line materials provided by the text publisher, and form study groups.
Laboratory Reports: Laboratory experiments are designed to provide hands on learning for concepts discussed in lecture. Example: Write a Lab Report, including an Abstract, Introduction, Methods, Results and Conclusion, about your bead lab model and the real world applications it illustrates.

Methods of Evaluation	Rationale
Homework	Homework Assignments: Students are asked to assimilate the assigned reading material. Example: Read chapter 2. Students should read chapter two and assimilate material. Method of material assimilation is not prescribed. It is suggested that students outline chapters, answer study questions in the text, utilize on-line materials provided by the text publisher, and form study groups.
Tests	Quizzes: Quizzes covering topics from lecture material and reading assignments are given. Example: A quiz covering the Hardy-Weinberg Equations is given to assess students' understanding of the application of this key concept.
Tests	Exams: Exams covering the material covered in lecture and reading assignments are given to assess student learning. Example: Exam one covers the scientific method, chemistry of life, biological molecules, cell biology, energy flow in biological systems, cellular respiration, and photosynthesis. The exam can be but is not limited to multiple choice, true/false, short answer and essay.
Other	Laboratory Reports: Laboratory experiments are designed to provide hands on learning for concepts discussed in lecture. Example: Write a Lab Report, including an Abstract, Introduction, Methods, Results and Conclusion, about your bead lab model and the real world applications it illustrates.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN

Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Rebecca Orr	Campbell Biology, 12th edition	Pearson	May 9th 2020	ISBN-13: 9780135988046

Other Instructional Materials

Description	Biology, 2nd Edition by OpenStax (open educational resource)
Author	No value
Citation	No value

Description	In-house created laboratory notes
Author	No value
Citation	No value

Description	Investigating Biology Laboratory Manual, 9th edition Lisa A. Urry Michael L. Cain Steven A. Wasserman Peter V. Minorsky Jane B. Reece Judith Giles Morgan M Eloise Brown Carter 2017
Author	No value
Citation	No value

Materials Fee

No

Learning Outcomes and Objectives

Course Objectives

Apply the processes of scientific inquiry including experimental design.

Carry out an experiment to test a specific hypothesis using appropriate controls.

Explain the essential elements of life, major hypotheses for life's history, mechanisms for the diversification of life, and macroevolution.

Apply the tools of evolutionary biology to the analysis and evaluation of historical relationships among organisms.

Describe mechanisms of evolutionary change including micro-evolutionary forces that determine patterns of genetic diversity within species.

Provide evidence for evolution.

Evaluate the ecological relationships of organisms at the population, community, and ecosystem level.

Describe flow of energy within an ecosystem and the role of nutrient cycling in maintaining ecosystem integrity.

Explain fundamental prokaryotic replication, metabolism, and cellular structure in relationship to evolution of diversity.

Compare and contrast differences in animal development and life cycles.

Compare and contrast differences in plant development and life cycles.

Describe how plants and animals maintain homeostasis: water and ion balance, gas exchange, energy and nutrient acquisition, temperature regulation.

For major taxa of protists, fungi, plants and animals: i) Identify major groups and arrange them within currently recognized taxa, ii) Compare and evaluate different phylogenies in terms of relationships amongst taxa, iii) Describe structural organization/morphology, iv) Identify and describe structures and relate them to their functions, v) Classify individual representative specimens to phylum.

CSLOs

Formulate research questions and use the scientific method to design experiments, collect and analyze data, derive conclusions, and write scientific reports. Expected SLO Performance: 70.0

Discuss evolutionary biology principles, including how the process of evolution has resulted in both similarities and differences between all living things. Expected SLO Performance: 70.0

Evaluate the ecological relationships of organisms at the population, community, and ecosystem level. Expected SLO Performance: 70.0

Describe the flow of energy within an ecosystem and the role of nutrient cycling in maintaining ecosystem integrity. Expected SLO Performance: 70.0

Identify the major groups of organisms and classify them within a phylogenetic framework. Expected SLO Performance: 70.0

Describe functions of organ systems in plants and animals, and how they maintain homeostasis. Expected SLO Performance: 70.0

Outline

Course Outline

Topical Outline:

A. Scientific Method
B. Evolutionary Biology

1. Decent with Modification
    a. The Darwinian View
    b. Evidence for Evolution
2. Evolution in Populations
    a. Hardy-Weinberg Equations
    b. Origin of Genetic Variation
3. Origin of Species
4. History of Life on Earth
    a. Conditions of Early Earth
    b. Key Events in Evolution of Life
    c. Extinction in Evolution of Life
    d. Major Changes in Body Form

C. Evolutionary History of Biodiversity
1. Phylogenetic Analysis for Showing Evolutionary Relationship
2. Prokaryotes: Bacteria and Archea
    a. Phylogeny of Prokaryotes
    b. Structural and Functional Diversity of Prokaryotes
    c. Ecological Importance of Prokaryotes
3. Protists
    a. Phylogeny of Protists
    b. Structural and Functional Diversity of Protists
    c. Ecological Importance of Protists
4. Plants
    a. Phylogeny of Plants
    b. Structural and Functional Diversity of Plants
5. Fungi
    a. Phylogeny of Fungi
    b. Structural and Functional Diversity of Fungi
    c. Ecological Importance of Fungi
6. Animals
    a. Animal Phylogeny
    b. Structural and Functional Diversity of Invertebrates
    c. Structural and Functional Diversity of Vertebrates

D. Plant Form and Function
1. Growth and Development
2. Resource Acquisition and Transport
    a. Modes of Transport
    b. Movement of Water and Minerals
    c. Movement of Sugars
3. Soil and Plant Nutrition
    a. Soil
    b. Nutrition
4. Angiosperm Reproduction
5. Plant Responses to the Environment

E. Ecology
1. Scope of Ecology
2. Distribution of Organisms
3. Biomes
4. Population Ecology
    a. Demography and Life History
    b. Population Growth and Regulation
5. Community Ecology
    a. Community Interactions
    b. Disturbance
    c. Biogeography
6. Ecosystems
    a. Energy and Chemical Cycling
    b. Human Activity and its Environmental Impact
7. Conservation and Restoration Biology
    a. Threats to Biodiversity
    b. Conservation of Populations and Landscapes
    c. Sustainability
8. Behavioral Ecology
    a. Sensory Inputs
    b. Learning
    c. Influence of Environment and Genetics
    d. Selection on Behavior

Lab Outline

1. Scientific Method
    a. Questions and Hypotheses
    b. Designing an Experiment
    c. Presenting and Analyzing Results
    d. Interpreting and Communicating results

2. Population Genetics
    a. Hardy –Weinberg Principle

3. Bacteriology
    a. Characteristics of Bacteria
    b. Ecological Succession
    c. Bacteria in the environment
    d. Controlling Bacterial Growth

4. Protists
    a. Excavata
    b. "SAR" Stramenopile, Alveolates, and Rhizarians
    c. Archaeplastida

5. Plant Diversity 1
    a. Bryophytes Non-vascular Plants
    b. Seedless Vascular Plants

6. Plant Diversity II
    a. Gymnosperms
    b. Angiosperms

7. Bioinformatics
    a. Phylogenetic Relationships among RuBisCo Large Subunit Genes
    b. Analyzing Phylogenetic Trees and Reporting Results

8. Fungi
    a. Zygomycota
    b. Ascomycotoa
    c. Basidiomycota
    d. Animal Diversity I
    e. Porifera
    f. Cnidaria
    g. Platyhelminthes
    h. Mollusca
    i. Annelida

9. Animal Diversity II
    a. Nematoda
    b. Arthropoda
    c. Echinoderma
    d. Chordata

10. Plant Anatomy
    a. Morphology
    b. Primary Growth and Development
    c. Cell Structure of Primary Tissues
    d. Structure of Tissues Produced by Secondary Growth

11. Plant Growth
    a. Seedling Germination
    b. Plant Growth Regulators
    c. Auxin
    d. Gibberellins

Delivery Methods

Delivery Method: Please list all that apply -Face to face -Online (purely online no face-to-face contact) -Online with some required face-to-face meetings (“Hybrid”) -Online course with on ground testing -iTV – Interactive video = Face to face course with significant required activities in a distance modality -Other

- Face to face

Rigor Statement: Assignments and evaluations should be of the same rigor as those used in the on-ground course. If they are not the same as those noted in the COR on the Methods of Evaluation and out-of-class assignments pages, indicate what the differences are and why they are being used. For instance, if labs, field trips, or site visits are required in the face to face section of this course, how will these requirements be met with the same rigor in the Distance Education section? Describe the ways in which instructor-student contact and student-student contact will be facilitated in the distance ed environments.

No Value

Good practice requires both asynchronous and synchronous contact for effective contact. List the methods expected of all instructors teaching the course. -Learning Management System -Discussion Forums -Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV - Interactive Video -Other

- Discussion Forums
- E-mail
- Face-to-face meeting(s)
- Telephone

Software and Equipment: What additional software or hardware, if any, is required for this course purely because of its delivery mode? How is technical support to be provided?

No Value

Accessibility: Section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden". I am using -iTV—Interactive Video only -Learning management system -Publisher course with learning management system interface.

- Learning management system

Class Size: Good practice is that section size should be no greater in distance ed modes than in regular face-to-face versions of the course. Will the recommended section size be lower than in on-ground sections? If so, explain why.

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Emergency Distance Education Options The course will operate in remote delivery mode when all or part of the college service area is under an officially declared city, county, state, or federal state of emergency, including (check all that apply) - Online including all labs/activity hours - Hybrid with online lecture and onsite lab/activity hours - Correspondence education in high school and prison facilities - None. This course will be cancelled or paused if it cannot be held fully onsite.

- Online including all labs/activity hours
- Hybrid with online lecture and onsite lab/activity hours