Cerro Coso College

Course Outline of Record Report

10/11/2021

BIOLC105 : Concepts of Biology

General Information

Author:	-
Course Code (CB01) :	BIOLC105
Course Title (CB02) :	Concepts of Biology
Department:	Science
Proposal Start:	Fall 2013
TOP Code (CB03) :	(0401.00) Biology, General
SAM Code (CB09) :	Non-occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000355797
Curriculum Committee Approval Date:	03/04/2016
Board of Trustees Approval Date:	04/14/2016
External Review Approval Date:	04/29/2011
Course Description:	This is an introductory course in biological science with laboratory experience for non-majors. The course illustrates the principles of organization, cell structure and function, genetics, metabolism, organ systems, reproduction (plant and animal), ecology, evolution, and animal behavior. The course is not open to students with credit in BIOL C101.
Submission Type:	New Course
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 is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Allowed Number of Retakes

0

Grade Options

- Letter Grade Methods
- Satisfactory Progress

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)

No value

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
CC Liberal Arts: Mathematics & Science	A.A. Degree Major	Summer 2018 to Fall 2020
CC Psychology for Transfer	A.A. Degree for Transfer	Spring 2018
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
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

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

No value

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

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

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

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.

Units and Hours:

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	108
Total Course Out-of-Class Hours	108
Total Student Learning Hours	216
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	3	6
Laboratory Hours	3	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	

Activity Hours	0	0

Lecture	0
Laboratory	0
Activity	0
Total	108

Course Out-of-Class Hours

Lecture	0
Laboratory	0
Activity	0
Total	108

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

ENGLC070 - Introductory Composition

In BIOL 105, students are expected to read a college-level textbook, journal articles and assigned internet readings with sufficient comprehension to be able to identify central points of reading materials, and to distinguish facts from opinions, identifying bias and drawing inferences. Students are also expected to be able to write summaries of assigned readings, answer homework questions using paragraph-length responses in clear and error-free prose, and complete lab reports. ENGL C070 provides the student with the requisite reading and writing skills to meet these expectations.

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	Demonstration
Rationale	No value
Methods of Instruction	Discussion
Rationale	No value
Methods of Instruction	Field Trip
Rationale	No value
Methods of Instruction	Guest Lecturers
Rationale	No value
Methods of Instruction	Laboratory
Rationale	No value
Methods of Instruction	Lecture
Rationale	No value
Methods of Instruction	Library
Rationale	No value
Methods of Instruction	Outside reading
Rationale	No value

Methods of Instruction	Project-based learning
Rationale	No value

Methods of Instruction	Written work
Rationale	No value

Assignments

Readings from the assigned textbook. Example: The student is expected to read the weekly reading assignments from the text which relate to the lecture topic prior to the lecture.
Outlining the chapters and incorporating lecture notes with chapter outlines. Example: Students are expected to outline the assigned text reading and to relate and integrate the outlines with the lecture notes.
Homework assignments. Example: The student is expected to answer the instructor assigned questions from the relevant text chapters and additional instructional materials other than the text.
Written laboratory reports. Example: The student is required to write a formal lab report in a format consistent with that published in a scientific journal. The report summarizes the laboratory methods performed, data collected, and data analysis for each week's lab activity. Data should be analyzed in the context of the experiment's hypothesis, and to make conclusions for the experiment.

Methods of Evaluation	Rationale
Tests	Quizzes covering topics from lecture material and reading assignments are given. Example: A quiz covering sub atomic particles and bonds is given to assess students' understanding of these concepts.
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 Experiments: Laboratory experiments are designed to provide hands-on learning for concepts discussed in lecture. Example: The effects of hypertonic and hypotonic solutions on cells are examined under the microscope to illustrate osmosis.
Homework	Homework Assignments: Students are asked to assimilate the assigned reading material. Example: Read chapter 2. Student should read chapter 2 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.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
	Simon, E.J., Dickey, J.L., Reece, J.B. & Hogan, K.A. . (2015) Essential Biology with Physiology, 5th Edition, Benjamin Cummings			

Other Instructional Materials

Description	Other: Lab Manual developed on-site.
Author	
Citation	Concepts of Biology

Materials Fee

No

Learning Outcomes and Objectives

Course Objectives

Define key biological terms and apply basic biological concepts.

Describe important processes of the cell including chemistry, cellular structures, energy flow, protein synthesis, cellular reproduction and inheritance.

Apply the concepts of evolutionary biology and natural selection to organism form and function.

Distinguish key features of the domains and kingdoms of organisms.

Compare and contrast the form and function of important organ systems of animals and plants.

Learn ecological processes of populations, communities, ecosystems and the biosphere to understand the biological impacts of local and global policies and actions.

Apply biological knowledge, principles and skills to understand bioethical issues, and to use these as foundations for lifelong learning.

Demonstrate an understanding of the scientific method and the philosophy of science by designing components of experiments and carrying out exercises safely.

CSLOs

Use biological information literacy to read, analyze and comprehend scientific literature. Expected SLO Performance: 70.0

Science Liberal Arts: Mathematics & Science AA Degree	Describe the nature of science, the methods applied in scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world.

Describe core biological processes at the cellular, tissue, organs and organ systems level, including chemistry, cellular structures, energy flow, protein synthesis, cell reproduction and inheritance. Expected SLO Performance: 70.0

Apply key concepts of evolutionary biology and natural selection to explain the unity and diversity of all living organisms. Expected SLO Performance: 70.0

Science Liberal Arts: Mathematics & Science AA Degree	Apply algebraic, graphical, numerical, and other methods to solve applied problems in the areas of mathematics, natural sciences, computer graphics, and computer animation.

Compare and contrast ecological processes of populations, communities, ecosystems and the biosphere. Expected SLO Performance: 70.0

Social Science Psychology AA Degree for Transfer	1. The student will be able to apply psychological principles to the development of interpersonal, social, and occupational skills. Assessment:Examination through the use of multiple choice and short answer.

Relate key biological advancements to their applications in daily life. Expected SLO Performance: 70.0

Social Science PLOs for CSU GE COA	Communicate scientific results by applying the appropriate scientific method, including experimental and empirical methodologies characteristic of science and modern methods and tools used in scientific inquiry through the use of graphs, oral communications, and writings.
Social Science IGETC PLOs	Communicate scientific results by applying the appropriate scientific method, including experimental and empirical methodologies characteristic of science and modern methods and tools used in scientific inquiry through the use of graphs, oral communications, and writings.

Perform lab skills correctly using the scientific method, and display a habit of accurate and safe lab practices. Expected SLO Performance: 70.0

Social Science Psychology AA Degree for Transfer	3. The student will be able to evaluate psychological data and apply the scientific method to psychological theory. Assessment:The student will complete a research project scored by a rubric.

Outline

Course Outline

A. Scientific Method
B. Characteristics of Life
C. Chemistry of Life
    1. Atomic Structure
    2. Chemical Bonding
D. Biological Molecules
    1. Organic Molecule Synthesis
    2. Carbohydrates
    3. Lipids
    4. Proteins
    5. Nucleic Acids
E. Cell Structures
    1. Membrane Structure
    2. Substances Crossing Membrane
    3. Prokaryotic Cell Structures
    4. Eukaryotic Cell Structures
F. Energy Flow in Life
    1. Energy Flow in Chemical Reactions
    2. Control of Metabolic Reactions
G. Photosynthesis

1. Light-Dependent Reactions
2. Light-Independent Reactions

H. Glucose Metabolism
1. Glycolysis
2. Cellular Respiration

I. DNA
1. Structure and Function
2. Replication

J. Gene Expression and Regulation
1. Relationship between Genes and Proteins
2. Transcription
3. Translation
4. Mutations and Genes
5. Gene Regulation

K. Cellular Reproduction
1. Function of Cellular Reproduction
2. Cell Cycle
3. Mitosis
4. Cytokinesis
5. Meiosis
6. Meiosis, Sexual Reproduction and Variability

L. Inheritance
1. Mendel and the Foundations of Inheritance
2. Single Trait Inheritance
3. Multiply Trait Inheritance
4. Sex Determination
5. Variations on Mendelian Genetics
6. Human Genetic Disorders

M. Biotechnology - Uses and Applications

N. Foundations of Evolution
1. Definition of Evolution
2. Darwin and His Ideas
3. Evidence for Evolution

O. Evolution in Populations
1. Gene Pool of a Population
2. Five Causes of Evolution
3. Natural Selection in Detail

P. Origin of Species
1. Allopatric and Sympatric Speciation
2. Maintenance of Reproductive Isolation
3. Causes of Extinction

Q. Systematics
1. Naming and Classifying Organism
2. Domains and Kingdoms
3. Biological Species Concept and Its Limitations
4. Phylogenetic Trees

R. Biodiversity of Microbes
1. Viruses
2. Bacteria and Archea
3. Single-Celled Eukaryotes

S. Biodiversity of Fungi and their Key Features

T. Biodiversity of Plants
1. Key Features
2. Evolutionary Origin of Plants
3. Colonization of Land

U. Biodiversity of Animals
1. Key Features
2. Major Branch Point of Evolutionary Tree
3. Survey of Phyla

V. Plant Form and Function
1. Roots
2. Stems
3. Leaves
4. Transport of Water
5. Transport of Sugars

W. Plant Reproduction

1. Pollination and Fertilization
2. Seed and Fruit Development
3. Seed Germination

X. Animal Circulation
1. Heart
2. Blood
3. Types and Functions of Blood Vessels
4. Lymphatic System

Y. Respiration
1. Gas Exchange
2. Human Respiratory Structures

Z. Digestion
1. Survey of Important Nutrients
2. Process of Digestion
3. Human Digestive Structures

AA. Immune System
1. Body's Defense System
2. Immune Response
3. Immune System Malfunctions

BB. Animal Reproduction
1. Types of Reproduction
2. Human Reproductive System
3. Limiting Fertility

CC. Population Ecology
1. Population Growth and Regulation
2. Human Population Growth

DD. Community Ecology
1. Competition
2. Predator-Prey Interactions
3. Symbiosis
4. Community Structure

EE. Ecosystem Ecology
1. Energy Flow
2. Nutrient Flow
3. Global Warming

FF. Biomes
1. Factors Influencing Weather and Climate
2. Life Distributed on Land
3. Life Distributed in Water

Lab Outline

Laboratory Experiments
1. Lab Safety
2. Scientific Method
3. Microscopy
4. Cells and Osmosis
5. Metabolism
6. Photosynthesis
7. Cell Division
8. Heredity
9. Molecular Dogma
10. Gel Electrophoresis
11. Natural Selection
12. Topics in Evolution
13. Circulatory System
14. Respiratory System
15. Reproductive system
16. Fetal Pig Dissection
17. Plant Survey
18. Plant Reproduction
19. Biomes

Laboratory exercises are designed to complement and reinforce the understanding of lecture materials.

Example: The effects of hypertonic and hypotonic solutions on cells are examined in experiments to illustrate the mechanism of osmosis.

Laboratory exercises also introduce students to proper laboratory practices and hypothesis driven inquiry. Students will learn to use the scientific method in designing and conducting experiments, analyzing data, and make inferences from the results obtained.

Delivery Methods and Distance Education

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 2 Face
Hybrid

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?

This course would only be taught hybrid with an onsite lab. For lecture, distance students complete equivalent work online (exercises, quizzes). In the online class, there is an additional component of sharing their experiences with the class in online discussions. Exams will be conducted onsite.

Effective Student-Instructor Contact: 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 -Moodle Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV -Interactive Video -Other (specify)

discussion forums
email

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.

itv
learning management system
publisher

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.

No Value