Cerro Coso College

Course Outline of Record Report

10/11/2021

BIOLC111 : General Biology I

General Information

Author:	• Sarah King
Course Code (CB01) :	BIOLC111
Course Title (CB02) :	General Biology I
Department:	Science
Proposal Start:	Fall 2018
TOP Code (CB03) :	(0401.00) Biology, General
SAM Code (CB09) :	Non-occupational
Distance Education Approved:	No
Course Control Number (CB00) :	CCC000188908
Curriculum Committee Approval Date:	04/15/2016
Board of Trustees Approval Date:	06/09/2016
External Review Approval Date:	04/29/2011
Course Description:	This is an introductory course for students majoring in biological sciences and related subjects. The course covers principles of cell biology, metabolism, biochemistry, molecular biology, genetics, and physiology.
Submission Type:	Mandatory 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 is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grade Options

- 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)

No value

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)

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	BIOL 190

CSU General Education Certification	Categories	Status	Approval Date	Comparable Course
Area B.2	Scientific Inquiry & Quantitative Reasoning Life Science	Approved	No value	BIOL 190
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	

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.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

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

AND

Prerequisite

CHEMC101 - Introduction to Chemistry

AND

Advisory

ENGLC070 - Introductory Composition

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	Other
Rationale	Classroom lecture and discussion of all course content. Presentations utilizing power point, chalkboard, whiteboard and internet. Laboratory exercises relating to lecture topics. Bacterial Transformation Laboratory: Students transform Escherichia coli with a plasmid containing the fluorescent green protein from jelly fish. Transformation rates are calculated and compared.
Methods of Instruction	Written work
Rationale	No value
Methods of Instruction	Project-based learning
Rationale	No value
Methods of Instruction	Problem Solving
Rationale	No value
Methods of Instruction	Library

Rationale	No value

Methods of Instruction	Outside reading
Rationale	No value

Methods of Instruction	Lecture
Rationale	No value

Methods of Instruction	Discussion
Rationale	No value

Methods of Instruction	Laboratory
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
Other	G. Laboratory Experiments: Laboratory experiments are designed to provide hands on learning for concepts discussed in lecture. E.g. The effects of hypertonic and hypotonic solutions on cells are examined under the microscope to illustrate osmosis.
Other	F. Three to four exams, multiple choice and essay, covering lecture and assigned reading material.
Other	E. Internet assignments, such as locating and utilizing scientific databases and articles.
Other	D. Two lab practicals requiring students to propose, evaluate, and/or formulate responses to materials presented.
Other	C. Lab reports and presentations
Tests	B. Quizzes covering material from the assigned readings.
Other	A. Readings from the assigned texts, leading scientific journals (e.g. Science, Nature, EMBO Journal, and Cell), and answering questions from the assigned materials.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
	A. Campbell, Reece, Mitchell . (2014) Biology, 10th, -Benjamin Cummings			

Other Instructional Materials

Description	Manuals: Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson, R.B., Morgan, J.G., Brown Carter, M.E. . (2013-10-23 00:00:00.0) Investigating Biology Manual, Pears
Author	
Citation	General Biology I

Materials Fee

No

Learning Outcomes and Objectives

Course Objectives

Describe the molecules that make-up living organisms and the properties of biological molecules, which allow them to carry out the chemical reactions of life.

Explain enzyme structure and function, and predict how they influence the enzymatic regulation of metabolic processes.

Explain cell structure and organization, and how they relate to cell functions for prokaryotic and eukaryotic cells.

Relate evolutionary processes to the origin and development of cells.

Explain how molecular biology, genetics, and cell development contribute to life at the cellular and organismal level.

Describe the basic tools and techniques of biotechnology, and assess how biotechnology impacts medicine, agriculture and society.

Recognize differences and similarities among the physiology of higher vertebrates and explain how organ systems maintain homeostasis.

Utilize library and internet biological resources in the study of biology and scientific writing.

Perform and design experiments relating to lecture material which demand implementation of the scientific method, and proper scientific formatting of lab reports.

Compare and contrast data and develop conclusions based upon gathered data.

CSLOs

Describe core biological processes and how organisms function at the molecular, cellular, tissue, organ and organ-system levels.

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.

Apply the fundamentals of chemistry and cell biology to explain how organ systems maintain homeostasis in higher vertebrates.

Expected SLO Performance: 70.0

Formulate research questions and apply the scientific method to design experiments, collect and analyze data, derive conclusions and write scientific reports.

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.
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.
ISLOs Core ISLOs	Students who are completing a program will be able to think critically and creatively and apply reasoning.

Apply biological principles, knowledge, and skills to comprehend scientific literature, and to understand how biological ideas impacts society.

Expected SLO Performance: 70.0

ISLOs Core ISLOs	Students who are completing a program will be prepared to engage in responsible citizenship at various levels.

Outline

Course Outline

A. Molecules of life
    1. Properties of water
    2. Aqueous solutions
        a. Solute concentration
        b. Acids, bases, pH

3. Carbon & molecular diversity
    a. Versatility of carbon in molecular architecture

b. Isomers
c. Functional groups
d. Chemical elements of life

A. Structure and organization of the cell
1. Microscopy
2. Prokaryotic and eukaryotic cells
3. Importance of compartmental organization
a. Ribosomes
b. Endomembrane system
i. nucleus
ii. Endoplasmic reticulumiii. Golgi

iv. Lysosomes v. Vacuoles vi. Plasma membrane vii. Peroxisomes
a. Peroxisomes
b. Mitochondria
c. Chloroplasts
d. Cytoskeleton

4. Structure and organization of biological membranes
a. Models of membrane structure
b. Trafficking of small molecules
c. Selective permeability
d. Diffusion and passive transport
e. Osmosis
f. Facilitated diffusion
g. Active transport
h. Exocytosis & endocytosis, trafficking of large molecules

A. Introduction to metabolism

1. Energy
a. Forms of energy
b. Thermodynamics

2. Enzymes
a. Biological catalysts
b. Enzyme specificity
c. Feedback inhibition
d. Cellular energy & work
e. Cellular respiration
a. Redox
b. Anaerobic respiration, substrate level phosphorylation
c. Aerobic respiration, oxidative phophorylation
d. Photosynthesis, photophosphorylation
e. Cellular communication

A. Genetics and molecular biology
1. Mitosis
2. Meiosis
3. Mendilian genetics
4. DNA, replication
5. RNA, transcription
6. Protein, translation
7. Microbial models: the genetics of viruses and bacteria
a. Gene regulation prokaryotes
b. DNA technology
i. Cloning
ii. Restriction Fragment Length Polymorphismiii. Current biotechnology topics

8. Gene structure and regulation in eukaryotes
a. Chromatin and DNA packing
b. Control of gene expression
c. Molecular biology of cancer

9. Genetic regulation of development
a. Differential gene expression
b. Drosophila as a model of genetic control of development

A. Anatomy and physiology of higher vertebrates
1. Digestion

2. Circulation and gas exchange
3. Immune system
    a. Non-specific response
    b. Specific response
    c. AIDS
    d. Allergy

B. Homeostasis
C. Endocrine system
D. Reproduction
    a. Asexual reproduction
    b. Sexual reproduction
    c. Human reproduction and sexually transmitted diseases

7. Nervous system
    a. Neurons, membrane potentials, and synapses
    b. Signal integration

8. Sensory and motor mechanisms
    a. Sensory receptors
    b. Muscles and glands Lab:
    c. The Scientific Method
    d. Enzyme Kinetics
    e. Microscopy
    f. Diffusion and Osmosis
    g. Photosynthesis and Cellular Respiration
    h. Cellular Division
    i. DNA Isolation and Bacterial Transformation
    j. Genetics
    k. Fetal Pig Dissection
    l. Human Blood and Circulation

Lab Outline

1. The Scientific Method
2. Enzyme Kinetics
3. Microscopy
4. Diffusion and Osmosis
5. Photosynthesis and Cellular Respiration
6. Cellular Division
7. DNA Isolation and Bacterial Transformation
8. Genetics
9. Fetal Pig Dissection
10. 10. Human Blood and Circulation

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 true

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?

No Value

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)

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.

No Value

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