

# BI 004: ELEMENTS OF BIOLOGY

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**Originator**

aglover

**Co-Contributor(s)****Name(s)**

Glover, Amy

**Justification / Rationale**

This proposal is for taking BI 004 - Elements of Biology, which is a Face-to-Face course and offering a hybrid option as well. The lab portion would remain face-to-face and the lecture would be moved online. This course is approved for transfer to the UC's and CSU's and fulfills the general elective for Biological or Life Science with a science laboratory (IGETC).

**Effective Term**

Fall 2023

**Credit Status**

Credit - Degree Applicable

**Subject**

BI - Biology

**Course Number**

004

**Full Course Title**

Elements of Biology

**Short Title**

ELEMENTS OF BIOLOGY

**Discipline****Disciplines List**

Biological Sciences

**Modality**

Face-to-Face

Hybrid

**Catalog Description**

An introduction to biology for non-science majors including the study of plants, animals, ecology, and evolution. The foundations of biology, including biochemistry, cell biology, genetics, anatomy and physiology, and the impact of humans on the environment will be covered in this course.

**Schedule Description**

An introduction to biology for non-science majors covering the foundations of biology with a laboratory component accompanying this course. Advisory: ENG 061 IGETC: 5B\*, 5C\*

**Lecture Units**

3

**Lecture Semester Hours**

54

**Lab Units**

1

**Lab Semester Hours**

54

**In-class Hours**

108

**Out-of-class Hours**

108

**Total Course Units**

4

**Total Semester Hours**

216

**Prerequisite Course(s)**

Advisory: ENG 061

**Required Text and Other Instructional Materials****Resource Type**

Book

**Author**

Campbell

**Title**

Essential Biology with Physiology

**Edition**

6th

**City**

San Francisco

**Publisher**

Pearson Benjamin Cummings

**Year**

2018

**College Level**

Yes

**Flesch-Kincaid Level**

12.7

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**Resource Type**

Manual

**Author**

Robert Rosteck

**Title**

Elements of Biology

**Publisher**

College of the Desert

**Year**2022

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**Class Size Maximum**

28

**Entrance Skills**

Use critical thinking skills in reading and composition.

**Requisite Course Objectives**

ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

**Entrance Skills**

Read and respond in writing beyond literal interpretation of reading assignments.

**Requisite Course Objectives**

ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

**Entrance Skills**

Organize and express ideas in writing, reports, and answering essay exam questions.

**Requisite Course Objectives**

ENG 061-Use theses to organize paragraphs into coherent analyses.

ENG 061-Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

**Entrance Skills**

Define, analyze, evaluate, explain, compare, and contrast ideas in writing.

**Requisite Course Objectives**

ENG 061-Use theses to organize paragraphs into coherent analyses.

ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

ENG 061-Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing.

**Entrance Skills**

Use appropriate vocabulary and style.

**Requisite Course Objectives**

ENG 061-Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing.

**Entrance Skills**

Apply standard rules of grammar, punctuation, composition mechanics, and use correct spelling.

**Requisite Course Objectives**

ENG 061-Use theses to organize paragraphs into coherent analyses.

ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

**Entrance Skills**

Combine information gained from reading assignments and lectures to other disciplines.

**Requisite Course Objectives**

ENG 061-Use theses to organize paragraphs into coherent analyses.

ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

ENG 061-Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

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**Course Content**

1. Introduction to Biology
  - a. The scope of life including evolution and the processes of science
  - b. Essential chemistry – basic chemistry – general and inorganic
  - c. The molecules of life – organic and biological
  - d. Cell structure and function
2. Biochemical Processes of Life and Reproduction
  - a. Cellular respiration – aerobic and anaerobic
  - b. Photosynthesis and its environmental impact
  - c. Cellular reproduction – mitosis and meiosis
  - d. Patterns of inheritance – Mendelian genetics
  - e. The structure and function of DNA and RNA
3. Evolution and Diversity
  - a. The Darwinian approach to population evolution
  - b. The Darwinian approach to biological diversity
  - c. The origin of life and the evolution of microbes
  - d. The colonization of land by plants and fungi
  - e. The evolution of animals
4. Ecology
  - a. The ecology of organisms, populations, and their evolutionary adaptations
  - b. Communities and ecosystems including energy flow and nutrient cycling
  - c. Human impact on the environment including crises and conservation
  - d. Controlling genes including cancer research and cloning of organisms
    - i. DNA technology including DNA in forensic science and gene therapies
  - e. Animal form and function relating to internal and external environments
5. Human Anatomy and Physiology
  - a. Human nutrition and the digestive system
  - b. Human circulation and respiration
  - c. Human immunity and immune disorders
  - d. Hormones and their role in human reproduction and development
  - e. Human nervous system including senses and motor systems
6. Plant Anatomy and Physiology
  - a. Plant structure and function and the relationship to life cycles
  - b. Plants and nutrients, hormones, and response to stimuli

**Lab Content**

1. Introduction to Biology
  - a. The Metric System and the Scientific Method
  - b. General and Organic Chemistry
2. Reproduction and Development
  - a. The Structure and Function of DNA and RNA
  - b. Mitosis and Meiosis
  - c. Mendelian Genetics
3. Biology of Organisms
  - a. Bacteria, Protists and Fungi Survey
  - b. Plant Structure and Function
  - c. Invertebrates
  - d. Vertebrates
  - e. Concepts of Animal Structure and Function
4. Human Anatomy and Physiology
  - a. Human Digestive and Circulatory Systems
  - b. Human Nervous, Muscular, and Skeletal Systems

### Course Objectives

Objectives	
Objective 1	Demonstrate an understanding of the concepts and principles of basic biology.
Objective 2	Identify and explain basic anatomical and physiological characteristics of life systems.
Objective 3	Demonstrate knowledge of essential life processes such as metabolism, photosynthesis, respiration, sensitivity, digestion, circulation, reproduction, ecology, evolution, and behavior.
Objective 4	List, identify, and analyze the information discussed in lecture and lab and use this data as a basis for reasoning, discussion, and calculation.
Objective 5	Use the microscope and other laboratory instruments.

### Student Learning Outcomes

Upon satisfactory completion of this course, students will be able to:	
Outcome 1	Explain the relationship between structure and function at the molecular, cellular, and organismal levels of biological organization.
Outcome 2	Examine how cells capture, store, and process energy.
Outcome 3	Analyze how information encoded in DNA determines evolutionary traits.
Outcome 4	Demonstrate the impacts of human activity on the environment and biodiversity.

### Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Laboratory	Hand on laboratory experiments designed to explore and understand the primary areas of biological science.
Discussion	In both the in-person and hybrid sections there will be weekly discussion questions based on the lecture material covered during that week.
Lecture	In the hybrid sections there will be a PowerPoint presentation with Audio lecture recorded over presentation or Zoom meetings and/or recordings, plus videos, research papers, and relevant biology articles. In the in-person sections, there will be a lecture presentation and group work/activities.

### Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Laboratory projects	1. Answering end of unit questions after completing each laboratory. 2. Weekly quizzes to assess student mastery of the previous week's laboratory.	In Class Only
Student participation/contribution	In hybrid sections: weekly discussion boards will be used to cover a topic presented in the lecture material. Students will earn participation points for contributing to the weekly discussion boards. In the in-person sections students will participate in lecture review questions and group activities to earn participation points.	Out of Class Only
Tests/Quizzes/Examinations	Laboratory practicals and quizzes will be in person. These evaluations will consist of short answer questions. Lecture quizzes and exams will be given via Canvas or during the face to face portion of the class. The lecture quizzes and exams will consist of multiple choice, matching, true/false and short answer questions.	In and Out of Class

### Assignments

**Other In-class Assignments**

1. Weekly quiz to assess student mastery of the previous week's laboratory.
2. Explanation of the laboratory meeting's exercise.
3. Laboratory exercises consisting of:
  - a. Practical study of representative examples (survey).
  - b. Performance or observation of experiments.

**Other Out-of-class Assignments**

1. Reading assignments based on lectures and current events in science.

**Grade Methods**

Letter Grade Only

**Distance Education Checklist**

Include the percentage of online and on-campus instruction you anticipate.

**Online %**

50

**On-campus %**

50

**Lab Courses**

**How will the lab component of your course be differentiated from the lecture component of the course?**

The lab component will remain face-to-face as a hands on portion of the course.

**From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?**

Course objective 5: Use the microscope and other laboratory instruments.

The laboratory portion of this course will remain face-to-face. The instructor will be in-person to monitor use of the microscope and other lab instruments needed for experiments.

**How will you assess the online delivery of lab activities?**

Lab activities will remain face-to-face for the hybrid modality.

**Instructional Materials and Resources**

**If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?**

Will restrict technologies to the college LMS.

**If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.**

Will restrict technologies to the college LMS.

**Effective Student/Faculty Contact**

**Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?**

**Within Course Management System:**

Discussion forums with substantive instructor participation  
Online quizzes and examinations  
Private messages  
Regular virtual office hours  
Timely feedback and return of student work as specified in the syllabus  
Weekly announcements

**External to Course Management System:**

Direct e-mail  
Posted audio/video (including YouTube, 3cm mediasolutions, etc.)

**For hybrid courses:**

Field trips  
Orientation, study, and/or review sessions  
Scheduled Face-to-Face group or individual meetings

**Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.**

- Weekly announcements will be posted to stay in contact with students so they are aware of what is occurring in the course.
- Students will be contacted through Canvas inbox or email and a reply to their emails or Canvas messages will occur within 24 hrs or sooner during the work week.
- Weekly discussion questions will be posted to allow for the instructor to interact with the students while allowing the students to interact with each other.
- Students will have a Student Discussion board in which they can interact with each other.
- Virtual office hours will be offered.

**If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.**

Face-to-face laboratory, review sessions, and/or field trips as part of a hybrid course will help students achieve the SLO's by exposing them to content and material they are learning within the LMS. This will give them hands-on experience to help make connections with the comprehensive biology concepts presented in the course.

**Other Information****Provide any other relevant information that will help the Curriculum Committee assess the viability of offering this course in an online or hybrid modality.**

Offering this course as a hybrid modality will allow flexibility for students while still providing a laboratory hands-on experience.

**Comparable Transfer Course Information****University System**

CSU

**Campus**

CSU San Bernardino

**Course Number**

BIOL 1000 BIOL 1000L

**Course Title**

Introduction to Biology Introduction to Biology Lab

**Catalog Year**

2022-23

**Rationale**

Comparable to BI 004

**COD GE**

C1 - Natural Sciences

**CSU GE**

B2 - Life Science

B3 - Laboratory Activity

**IGETC GE**

5B - Biological Science

5C - Science Laboratory

**MIS Course Data****CIP Code**

26.0101 - Biology/Biological Sciences, General.

**TOP Code**

040100 - Biology, General

**SAM Code**

E - Non-Occupational

**Basic Skills Status**

Not Basic Skills

**Prior College Level**

Not applicable

**Cooperative Work Experience**

Not a Coop Course

**Course Classification Status**

Credit Course

**Approved Special Class**

Not special class

**Noncredit Category**

Not Applicable, Credit Course

**Funding Agency Category**

Not Applicable

**Program Status**

Program Applicable

**Transfer Status**

Transfer CSU, limited UC

**Allow Audit**

No

**Repeatability**

No

**Materials Fee**

No

**Additional Fees?**

No

**Approvals****Curriculum Committee Approval Date**

11/01/2022

**Academic Senate Approval Date**

11/10/2022

**Board of Trustees Approval Date**

12/16/2022

**Course Control Number**

CCC000313482

**Programs referencing this course**Elementary Teacher Assistant Special Education, Bilingual Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=132>)



Elementary Teacher Assistant Special Education Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=133>)  
Psychology AA-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=19>)  
Child and Adolescent Development AA-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=194>)  
Liberal Arts: Math and Science AA Degree (<http://catalog.collegeofthedesert.eduundefined/?key=29>)  
Public Health Science AS-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=37>)  
Agri-Business AS Degree (<http://catalog.collegeofthedesert.eduundefined/?key=46>)  
General Agriculture AS Degree (<http://catalog.collegeofthedesert.eduundefined/?key=49>)  
Elementary Teacher Education AA-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=5>)  
Nutrition and Dietetics AS-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=7>)  
Agriculture Food Safety Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=83>)  
Agriculture Office Assistant Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=84>)  
Agriculture Office Professional Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=85>)  
Agriculture Pest Management Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=86>)  
Agriculture Technician Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=87>)  
Agriculture Irrigation Technician Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=91>)