

Phase IIB CCN TEMPLATE

Background

- This CCN Course Template was developed by Biology discipline faculty representatives from the California Community Colleges, California State University, University of California and independent colleges and universities during October-December 2024, starting with local course outline of record and syllabi information provided by intersegmental faculty during the pre-convening survey process.
- Development of the CCN Course Template was facilitated by ASCCC with advisory input from segment articulation officers and transfer experts.
- Approved and Submitted to the Chancellor's Office: June 2025

Subject: Biology	Subject Code: BIOL
Proposed Course Number (Identical): C1000	
Course Title (Identical): Introduction to Biology with Lab	
Catalog/Course Description Part 1 (Identical and Required): This combined lecture and laboratory course provides the non-biology major with an introduction to living things and their environment. Students use experimentation and investigation to develop important critical thinking skills. Students learn about the process of science, the building blocks of life, the role and regulation of DNA, how populations change over time, the movement of energy within and between life forms, and how species interact with each other and their surroundings. By the end of the course, students will be able to apply an understanding of biological concepts to current issues and their impacts on society. Part 2 (Optional Expanded Description, Local College Discretion):	



Minimum Unit Threshold | 4.0 Semester Units (including a minimum of 1.0 semester unit of lab)

Unit amounts must adhere to the established minimum.

Prerequisites (Identical): None

Co-Requisites (Identical): None

Other Limitations on Enrollment (determined locally)

Advisories/Recommended Preparation (determined locally)

Course Content**Part 1: Required Topics (Identical):**

1. The scientific method and the process of science
2. Cellular chemistry and biochemistry
 - a. Atoms and bonding
 - b. Properties of water
 - c. Structure and function of biological molecules
3. Cell structure and function
 - a. Cells, membranes, and organelles
 - b. Prokaryotes versus eukaryotes
 - c. Transport across the cell membrane
4. Cellular metabolism
 - a. Enzyme structure and function
 - b. Photosynthesis
 - c. Cellular respiration
 - d. Fermentation
5. Cellular division
 - a. Prokaryotic binary fission
 - b. Eukaryotic cell cycle
 - c. Eukaryotic asexual reproduction (mitosis)
 - d. Eukaryotic sexual reproduction (meiosis)
6. DNA structure and function
 - a. DNA replication
 - b. Transcription and translation
 - c. Regulation of gene expression
 - d. The impact of mutations
 - e. The impact of biotechnology
7. Principles of heredity
 - a. Mendelian genetics
 - b. Non-Mendelian genetics
 - c. Application to human genetics



8. Principles of evolution
 - a. Evolutionary mechanisms
 - b. Evolutionary evidence
 - c. Speciation and classification
 - d. The effect of extinction
 - e. Survey of biodiversity across Domains
9. Principles of ecology
 - a. Biosphere and biomes
 - b. Population growth and regulation
 - c. Community interactions
 - d. Flow of energy and matter in ecosystems
 - e. Human interactions with the biosphere
 - f. Conservation biology and sustainability

Part 2: Optional Expanded or Additional Topics (optional):

Laboratory Content

Part 1: Required Topics (Identical):

1. Process of science and experimental design
2. Personal protective equipment, care and safe use of laboratory equipment
3. Utilization of microscopy to visualize and identify cell structures
4. Cellular transport mechanisms
5. Energy cycling and metabolism
6. Cell division
7. Genetics and inheritance
8. Diversity of life
9. Evolution
10. Ecology

Part 2: Optional Expanded or Additional Topics (optional):

Course Objectives/Outcomes

Part 1 (Identical and Required):

At the conclusion of this course, the student should be able to (Identical and Required):

1. Apply the scientific method, including recognizing the elements of experimental design, gathering and analyzing data, and interpreting results.
2. Demonstrate scientific literacy by evaluating social, ethical, and equity issues connected to biological sciences
3. Describe how living things are made of smaller structures that work together to enable the organism to survive.
4. Compare how living things depend on each other and the physical environment as they interact to obtain, change, and exchange matter and energy.
5. Explain how the diversity of living things is the result of evolution of organisms through mechanisms such as heredity, random change, and natural selection.
6. Collaborate on laboratory investigations of the biological content using appropriate, safe methods and equipment.

Part 2 Optional objectives/outcomes (optional):

At the conclusion of this course, the student should be able to:

Methods of Evaluation

Part 1 (Identical and Required):

Examples of evaluation methods used to observe or measure students' achievement of course outcomes and objectives may include but are not limited to quizzes, exams, laboratory work, field journals, projects, research demonstrations, etc.

Methods of evaluation are at the discretion of local faculty.

Part 2 List Additional Methods of Evaluation (Optional):

Representative Texts, Manuals, OER, and Other Support Materials

Part 1 (Identical and Required):

Texts used by individual institutions and even individual sections will vary.



Textbooks

OER Example:

- Fowler, S., Wise, J., & Roush, R. (2024). Concepts of Biology. OER: OpenStax.
<https://openstax.org/books/concepts-biology/pages/1-introduction>
- Traditional Examples:
- Hoefnagels, M. (2021). Biology: The Essentials. 4th ed.: McGraw Hill.
- Taylor, M., Simon, E., Dickey, J., & Reece J. (2020). Campbell Essential Biology. 7th ed.: Pearson.

Lab manuals

An example of a publisher lab manual is:

- Bres, M., & Weisshaar, A. (2018). Thinking About Biology: An Introductory Lab Manual (What's New in Biology). 6th ed.: Pearson.
- Locally developed manual

Part 2 List Sample Textbooks, Manuals, or Other Support Materials (optional):

Date Approved:

June 16, 2025, following ASCCC facilitation of template development process, including engagement of faculty discipline representatives from California Community Colleges, California State University, University of California, and independent colleges and universities and advisory input from segment articulation officers and transfer experts.