

**Bossier Parish Community College
Master Syllabus**

Course Prefix and Number: BLGY 105

Credits Hours: 3

Course Title: Elements of Biology I

Course Prerequisites: None

Textbook: Hoefnagels, Biology: The Essentials; Third edition

Course Description:

A survey of broad biological principles for non-science majors. The course topics include scientific method, biological molecules, cell structure and function, genetics and evolution.

Learning Outcomes:

Upon successful completion of this course, the student will

- A. utilize fundamental principles and terminology of biology to describe the interaction and function of living organisms;
- B. apply knowledge of the structure and function of cells to the understanding of organisms;
- C. utilize basic genetic principles to explain heredity, evolution, and classification of organisms; and
- D. relate biological principles to interpret current scientific developments in biological science.

To achieve learning outcomes, the student will

- 1. describe the scientific method and differentiate between hypothesis and theory. (A,D)
- 2. explain how a controlled experiment is used to test a hypothesis. (A,D)
- 3. list and explain the biological principals and themes, including homeostasis and evolution. (A,D)
- 4. distinguish between an atom and an element and list the elements that comprise 99% of living matter. (A)
- 5. list the subatomic particles and relate the structure of an atom to its chemical properties. (A)
- 6. list and explain the properties of water. (A)
- 7. identify and state the function of macromolecules. (A)
- 8. differentiate between eukaryotic and prokaryotic cells and describe the advantages of specialization in eukaryotic cells. (B)
- 9. describe the components and physical properties of cell walls, plasma membranes, and cytoskeleton. (B)

10. list the cellular organelles, indicating the functions of each. (B)
11. explain how the fluid mosaic model describes the structure of the plasma membrane. (B)
12. describe the types of active and passive transport, explaining how each functions to move substances in biological systems. (B)
13. explain how cells divide. (B,C)
14. describe how the ATP molecule is formed and its role in energy transfer. (B)
15. summarize the photosynthetic process by tracing the steps in the conversion of light energy to chemical energy. (B)
16. relate the structure of a chloroplast to its function. (B)
17. describe the four major processes in cellular respiration, stating where each takes place and listing their products. (B)
18. explain fermentation. (B)
19. describe how cells reproduce, by listing the events that occur during the stages of the cell cycle. (B, C)
20. list the stages of meiosis and describe how meiotic events halve chromosome numbers during gamete formation. (B, C)
21. list Mendel's principles and describe how his experimental crosses illustrate each. (C)
22. use a Punnett square to predict phenotypic and genotypic ratios of genetic crosses. (C)
23. describe the components and spatial arrangement of the DNA molecule as proposed by Watson and Crick. (C)
24. explain how DNA molecule replicates. (C)
25. compare RNA to DNA. (C)
26. explain what is meant by the genetic code and the central dogma. (C)
27. state how the Hardy-Weinberg principle accounts for constant allele frequencies within a population. (C)
28. differentiate between various types of recombinant DNA technology. (C)
29. discuss the advantages and possible problems associated with genetic engineering. (C)
30. list ways genetic engineering techniques are used in agriculture and medicine. (C)
31. explain how species arise and change over time, including natural selection, mutation, and evolution. (C)
32. describe the Linnaean system of taxonomy. (C)
33. name the three domains into which living things are grouped. (C)
34. Recognize that scientific knowledge is subject to change by summarizing a minimum of 3 biological science current event articles (D)

Course Requirements:

To earn a grade of "C" or higher, the student must earn 70% of the total points for the course and meet all of the following course requirements.

- Minimum overall average of 70% on all test, including the final exam
- Minimum of 50% on the final exam

- Students enrolled in this course in an online format will be required to take the comprehensive final exam in a proctored environment, on the BPCC campus or with an approved proctor

Course Grading Scale:

- A- 90% or more of total possible points and meets all course requirements
- B- 80% or more of total possible points and meets all course requirements
- C- 70% or more of total possible points and meets all course requirements
- D- 60% or more of total possible points and meets all course requirements
- F- Less than 60% of total possible points or fails to meet all course requirements

Attendance Policy: The college attendance policy is available at <http://www.bpcc.edu/catalog/current/academicpolicies.html>

Nondiscrimination Statement

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COORDINATOR FOR SECTION 504 AND ADA

Angie Cao, Student and Disability Services Specialist

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acao@bpcc.edu

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Equity/Compliance Coordinator

Teri Bashara, Director of Human Resources

Human Resources Office, A-108

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Bossier City, LA 71111

Phone: 318-678-6056

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Reviewed by M. Crane/ February 2020