

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: Johnson, G.B.; Essentials of The Living World, 3rd edition

Course Description:

An introductory course of biology for non-science majors. The curriculum includes a survey of the basic concepts and principles that control the functioning of all living organisms.

Learning Outcomes:

At the end of this course, the student will

- A. utilize fundamental principles and terminology of biology to describe the interaction and function of living organism;
- B. apply knowledge of the structure and function of cells to the understanding of organisms;
- C. synthesize basic genetic principles to explain heredity, evolution, and classification of organisms; and
- D. integrate 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,F)
- 2. explain how a controlled experiment is used to test a hypothesis. (A,F)
- 3. list and explain the biological principals and themes. (A,F)
- 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 life. (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)
25. explain how DNA molecule replicates. (C)
26. compare RNA to DNA. (C)
27. explain what is meant by the genetic code. (C)
28. state how the Hardy-Weinberg principle accounts for constant allele frequencies within a population. (C)
29. briefly outline the steps in recombinant DNA technology. (C)
30. discuss the advantages and possible problems associated with genetic engineering. (C)
31. list ways genetic engineering techniques are used in agriculture and medicine. (C)
32. explain how species arise. (C)
33. describe the Linnaean system of taxonomy. (C)
34. name the five kingdoms into which living things are grouped. (C)

Course Requirements:

In order to receive a grade of "C" the student must earn 70% of the total possible points for the courses and achieve each of the course requirements listed below:

- minimum of 70% average on all tests (including the final exam)
- summarize a minimum of 3 biological science current event articles

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

R.Johnson, spring 2011