

Bossier Parish Community College
Master Syllabus

Course Prefix and Number: BLGY 105

Credits Hours: 3

Course Title: Elements of Biology

Course Prerequisites: None

Textbook: Johnson, G.B.; The Living World, 6th 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;
- D. apply knowledge of the biology of microorganisms, fungi, plants, and animals to their impact on the environment and man;
- E. utilize basic knowledge of the anatomy and physiology of the human body; and
- F. 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 six 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,F)
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, F)
32. describe how variations are produced and environmentally maintained in a population. (C)
33. explain how populations produced by stabilizing, directional, and disruptive selection influence variation within a population. (C)
34. describe two mechanisms that bring about genetic drift in small populations. (C)
35. list several isolating mechanisms. (C)
36. explain how species arise. (C)

37. explain some difficulties encountered in defining the term species. (C)
38. describe the Linnaean system of taxonomy. (C)
39. name the five kingdoms into which living things are grouped. (C)
40. describe the structure, reproduction, and importance of viruses as agents of disease. (D)
41. list the different types of bacteria and describe their diverse habitats. (D)
42. list types of motion and a unique feature of each group of protists. (D)
43. describe representatives in the four divisions of fungi. (D)
44. list ways in which fungi are beneficial and detrimental to humans. (D)
45. describe the alternation of gametophytic and sporophytic generations in plants. (E)
46. list bryophytes and explain how they differ from vascular land plants. (D)
47. list vascular land plants and describe their special adaptations to terrestrial life. (D)
48. differentiate between gymnosperms and angiosperms. (D)
49. list some evolutionary trends in flower development. (D)
50. describe the structure and function of plant tissues. (D)
51. describe the parts of an Angiosperm flower. (D)
52. name the major phyla of animals and their classes. (D)
53. describe the body plan of each class and distinguish between simple and advanced characteristics. (D)
54. describe types of body symmetry and lab direction and relate it to an animal's body. (D)
55. describe and give characteristics of the major vertebrates. (D)
56. explain the key characteristics of the major orders of mammals. (D)
57. describe how the human body is organized. (E)
58. discuss the principal tissues. (E)
59. identify the major bones of the axial and appendicular skeletons. (E)
60. explain the three kinds of muscle. (E)
61. name some of the major muscles. (E)
62. explain the circulatory system by tracing blood flow through the heart. (E)
63. discuss the mechanics of breathing. (E)
64. describe the human digestive system. (E)
65. explain how the body eliminates waste. (E)
66. describe how the skin is the first line of the body defense system. (E)
67. describe how the cellular counter attack is the second line of the body defense system. (E)
68. describe how the immune system is the third line of the body defense system. (E)
69. explain the voluntary nervous system and the autonomic nervous system. (E)
70. describe the brain, spinal cord, and sensory organs. (E)
71. discuss the major endocrine glands. (E)

Course Requirements

- minimum of 70% average on tests
- summarize a minimum of 3 biological science current event articles

Course Grading Scale:

- A- 90% or more of total possible points and a minimum average of 70% on tests and satisfactory summarization of at least 3 biological science current event articles
- B- 80% or more of total possible points and a minimum average of 70% on tests and satisfactory summarization of at least 3 biological science current event articles
- C- 70% or more of total possible points and a minimum average of 70% on tests and satisfactory summarization of at least 3 biological science current event articles
- D- 60% or more of total possible points and a minimum average of 70% on tests and satisfactory summarization of at least 3 biological science current event articles
- F- less than 60% of total possible points or less than a minimum average of 70% on tests or failure to satisfactorily summarize 3 biological science current event articles

Reviewed by Roishene Johnson / May 6, 2009