**BSC 2010C**  
**Fundamentals of Biology I (5) A.A.**

**Course Description:** BSC2010C Fundamentals of Biology I (5) (A.A.) Three hours lecture and 3 hours lab per week. Prerequisite: CHM 1025C with a grade of “C” or better or one year of high school preparatory chemistry. This course meets Area V requirements for the A.A./A.A.S./A.S. general education requirement. This course is the first portion of a comprehensive study of the fundamentals of biology, including molecular biology, cellular biology, genetics, cell respiration, and cell replication. This course is intended for the science and science-related majors. It is strongly recommended that students without recent coursework in biology take BSC 1007C.

**Performance Standards:**

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

1. Explain the scientific method and be able to distinguish between a valid and invalid experiment.
2. Identify the major macromolecules (carbohydrates, lipids, proteins and nucleic acids) and state their importance to living organisms.
3. Distinguish between a condensation synthesis (dehydration) and a dehydration reaction (hydrolysis).
4. Define the terms metabolism, anabolism, and catabolism, and be able to identify anabolic and catabolic reactions.
5. Define the first two Laws of Thermodynamics.
6. Distinguish between and endergonic and an exergonic reaction.
7. State the ATP - ADP cycle and state its importance to living organisms.
8. Describe the importance of enzymes in biochemical processes.
9. Distinguish between prokaryotic and eukaryotic cells.
10. List the taxonomic kingdoms, and give examples of organisms belonging to each kingdom.
11. Name the organelles of a cell and state the functions of each organelle.
12. Describe the fluid mosaic model of membranes and state the implications this model brings to the living cell.
13. List the methods by which items enter and leave the cell.
14. State the general equation for cellular respiration.
15. Explain glycolysis, Krebs cycle, the electron transport chain, the chemiosmotic theory, and fermentation.
16. Know the differences in energy yield in anaerobic versus aerobic energy processes.
17. State the general equation for photosynthesis.
18. Explain the following as they relate to photosynthesis: photo pigments, photo systems, light dependent and light independent reactions.
19. Explain the cell cycle, and name the phases of mitosis.
20. Define the organelles involved in cell division and state their function.
21. Name the phases of meiosis.
22. List the differences between mitosis and meiosis.
23. Define alleles, dominance, recessive, P, F1, and F2 generations, homozygous, heterozygous, phenotype, and genotype and state their importance to genetics.
25. Demonstrate inheritance for a single gene trait.
27. Explain the chromosomal basis of sex determination.
28. Explain sex linked inheritance and give examples.
29. Characterize alterations in chromosome numbers and common associated disorders in humans.
30. Explain the structure of DNA, including the double helix, arrangement of nucleotides, and pairing of nitrogen bases.
31. Describe DNA replication, emphasizing the steps of the process in eukaryotic cells.
32. Illustrate the one gene - one polypeptide concept.
33. List the steps of transcription and translation, and include a discussion of the structure of RNA compared to DNA, the kinds of RNA involved, and the cellular structures involved in each process.
34. Characterize the concept of mutation from a molecular sense.
35. Explain the present technology in genetic engineering.

Last Revision: 7/21/06

Last Review: