MEDGAR EVERS COLLEGE-CUNY
Department of Biology
School of Science, health and Technology
Course Outline for
Bio 101: Introduction to the Science of Biology

Text Book and Lab Manual:

Sylvia S. Mader (2007) Essential of Biology First Edition, McGraw Hill
Sylvia S. Mader (2008) Laboratory Manual to Accompany Essentials of Biology, McGraw Hill

I **Weekly Activities and Assignments**

Week **Lecture topics**

1 **A view of Life (Chapter 1)**
a. The unity and diversity of life
b. Science as a way of knowing
c. Science and society

2, 3 **The Chemical Basis of Life (Chapter 2 & 3)**
a. Atomic structure: a brief description on arrangement of electrons, protons, and neurons in simple atoms present living being.
b. Water, acid, bases, pH, and buffers: properties, definition, and importance.
c. Types of chemical bonds: reference to carbon atom, carbon skeleton, and functional groups.
d. The organic molecules of the cells: Carbohydrates, lipids, proteins, and nucleic acids.

4 & 5 **Inside the Cell (Chapter 4)**
a. Cells under microscope
b. Main two types of cells: prokaryotic and eukaryotic
c. Cell organelles and their function: animals vs plant cells
d. Cell membrane: composition, structure and function; movement of substances across membranes (active and passive transport).

6 **Metabolism (Chapter 5-7)**
a. An overview of energy, ATP and enzymes
b. Energy generation in cells: overview of glycolysis and respiration
c. Photosynthesis: an overview.

7 **Cellular Reproduction (Chapter 8-9)**
a. Mitosis and cytokinesis: different phases and implication in cancer
b. Meiosis: different phases.
c. Mitosis and Meiosis: compare.

8 & 9 **Patterns of Inheritance Chapter 10 & 13**

a. Mendel's laws
b. Sex linked inheritance
c. Counseling for chromosomal and gene disorder.

10 **DNA Biology and Technology (Chapter 11)**

a. Structure of DNA, RNA, and protein
b. Biosynthesis of DNA, RNA, and protein: an overview
c. Recombinant DNA technology: overview of techniques including PCR

11 **Darwin and Evolution (Chapter 14 and 15)**

a. Darwin's theory of evolution
b. Evidence of evolution.

12 **The First Forms of Life (Chapter 17 & 18)**

a. The viruses: life cycle and importance
b. Prions and bacteria: Medical importance
c. Fungi, plants and animals: importance

13 **Human Nutrition (Chapter 25)**

a. Introduction to nutrition
b. The classes of nutrients
c. Vitamins: sources and deficiency symptoms

14 **Ecology (Chapter 30-32)**

a. An overview of population and community interactions
b. Components of ecosystem, cycling of materials through ecosystem (water and carbon cycles)
c. An overview of human impact on the biosphere.

15 DEPARTMENTAL TEST ON ALL LECTURES

I I LABORATORY SESSIONS

Lab requirements: Laboratory coat, gloves, and safety eye glasses must be worn in the laboratory. Students must sign a form acknowledging that they have received lab safety instructions. Each lab session has an assigned reading in the lab manual. Lab reports are due at the beginning of next session. Attendance is required. **No make-up labs and lab tests are available.**

Lab1: Laboratory safety; use of metric measurement for length and volume; Microscopy-use, care, and focusing objects (letter "e", cross threads).

Lab 2: Study of cells: preparation of slides-onion cells, cheek cells, Elodea cells. Show cell membrane, cell wall, cytoplasm, and nucleus.

Lab 3: Wet mount of protista (Euglena and Clamydomonas) and fungi. Permanent slides-bacteria, amoeba, Euglena.

Lab 4: Osmosis, plasmolysis using onion cells

Lab 5: Mitosis: Different phases of mitosis (video); mitosis in onion and fish blastula cells.

III. COURSE EVALUATION

Class test and Assignments	50%
Lab Report and Test	25%
Course Final	25%

Grading scale: 97 – 100 = A+; 93-96 = A; 90-92 = A-
87-89 = B+; 83-86 = B; 80-82 = B-
77-79 = C+; 73-76 = C; 70-72 = C-
67-69 = D+; 63-66 = D; 60-62 =D-
0-59= F. A grade of “D+ “ or below is not acceptable toward a degree at Medgar Evers College.

Bibliography:

1. Campbell, N.A., J.B. Reece, and E.J. Simon (2007) Essential Biology. Third Edition, Pearson Benjamin Cummings.
2. David Krogh (2007) A Brief Guide to Biology. Pearson Prentice Hall.