

Biology I (BIO 106)
Tribhuvan University
Soch College of Information Technology
Bachelor of Science in Computer Science and Information Technology

Course Title: Biology I

Course no: BIO-106 ----- Full Marks: 60+20+20

Credit hours: 3 ----- Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Living System and their properties, major biological molecules, basic physiological processes, introduction of genetics, basic concepts of diversity and evolution.

Goal: The course is aimed at providing the introduction of biological system with respect to nature, behavior and functioning of the cell.

Course Contents:

Unit 1. ----- 5 Hrs.

1.1 Introduction: Brief introduction to all aspects of Biology

1.2 Bio-molecular: Carbohydrates, Lipids, Proteins and Nucleic acid

Unit 2. ----- 19 Hrs.

2.1 Cell structure and functions: Cell theory, cell membrane, transport system across the membrane, organelles composed of membranes, nonmembranous organelles, nuclear components and major cell types

2.2 Enzymes: Nomenclature, biocatalysis, action of enzymes, environmental factors, co-enzymes, enzyme activation and inhibition.

2.3 Biochemical Pathways: Introduction, cellular respiration, glycolysis, TCA Cycle, ETC, ATP calculation, fermentation, protein and fat metabolism, photosynthesis-C3 and C4 pathways, photorespiration, chemosynthesis, transpiration.

Unit 3. ----- 7 Hrs.

3.1 Genetics: Laws of inheritance, linkage and crossing over 3.2 Diversity within species: Gene pool concept, genetic variety, role of natural selection in evolution, factors influencing natural selection, Hardy-Weinberg equilibrium concept and application

Unit 4. ----- 6 Hrs.

4.1 Material exchange in the body: Basic principle, blood circulation, pulmonary and systemic, nature of blood and role of heart, gas exchange, respiratory anatomy, lung function, digestive system, kidney structure and function

Unit 5. ----- 8 Hrs.

5.1 Body's control mechanism: Nerve impulse, synapse, CNS organization, endocrine system, sensory input and output coordination

5.2 Immune system: Defense mechanism, humeral and cell mediated immune responses, vaccines and monoclonal antibody.

Laboratory Works:

Identification of biomolecules: cellulose, Lignin, Lipid, Protein.

Analysis of amino acids in protein by paper chromatography and paper electrophoresis.

Separation of photo synthetic pigments by paper chromatography.

Determination of value of RQ of different respiratory substrates.

Study of different types of plant and animal cells in temporary preparation.

Text Books:

E.D. Enger & F.C. Ross, Concepts in Biology, 9th Edition, Tata McGraw Hill

Reference Book:

P.H. Raven et.al, Biology, 5th Ed. WBC McGraw Hill.