Principles of Biochemistry

Course Code: JAL 202
Credits: 2-1-0
Instructor: Dr. Varuna H P

Part A

1. *Chemical Basis of Life*
2. Elixir of Life on Earth – Water, the medium of all Biohemical Processes. The physical and chemical properties of water at the root of life processes..
3. Cell – the unit of life where biochemical processes occur during birth, life and death of cell.
4. Physical and Chemical Principles underlying the Biochemistry in the cell
5. Introduction to the Chemistry of three major components of cell – Proteins, nuleic acids and carbohydates.
6. Chemistry of small molecules necessary for the cell to survive and function
7. Chemistry of biomembranes in different classes of cells.
8. Types of Chemical Reactions occurring in the cell – redox, addition, substitution, hydrolysis and proteolysis, disproportionation and free radical. *Concept of Free energy coupling of different chemical pathways in cell.*

Part B

1. Proteins - Composition and Structure
   Primary, secondary, tertiary and quarternary structures.
   Structure function correlation in proteins.
   Experimental methods to find these structures and use of pymol and artificial intelligence to predict the structure of the proteins.
   Preliminary concepts of Enzymolgy and enzyme kinetics to understand a major function of proteins in the cell.
   Biochemical Basis of Immune Function
2. Nucleic acids, DNA and RNA – *Chemistry and Structure*
   Chemical Synthesis of nucleic acids.
   Chemical Basis of Genes and Genetic Code
3. Carbohydrates , structure and the role in the cell. Carbohydrate binding proteins.
4. Lipids and Cell Membranes

Part C

1. Metabolisms to keep the cells functional . Diseases related to faulty metabolism.

Part D

Basic introduction to Neurochemistry.