

**Objective(s)**

To acquire knowledge about role of information technology in reading biological data, computer programming use in analysis and interpretation of biological data.

**UNIT I**

Introduction to biomolecules and central dogma of molecular biology; Carbohydrates, lipid, protein, nucleic acid-concept, Brief introduction of DNA and RNA, Gene expression, Protein Synthesis, Genomic rearrangement and DNA repair.

**UNIT II**

Organization of biological data, (Databases raw and processed) querying in the databases

**UNIT III**

Primers in biology, Exploration of databases (Design and primers and different kinds of primers used in analysis), combinatorial problems in biology, Gene finding, motif finding and multiple sequence alignment

**UNIT IV**

Mechanism and flow of information in biology, Management and analysis of biological data Protein sequence analysis (Theory and algorithms), Protein structure analysis and applications.

**UNIT V**

Genome analysis, Protein folding, Protein Engineering and Drug design; Blast etc; Data mining on large data bases of biological data; Tools for NGS data analysis.

**Reference Book(s)**

1. Introduction to Bioinformatics – by T. K. Attwood and David J. Perry-Smith. Prentice Hall.
2. Bioinformatics for dummies – by Jean-Michel Claverie and Cedric Notredame. Wiley Publications
3. Bioinformatics: Methods and Protocols – by Stephen Misener and Stephen A. Krawetz (Eds.). Humana Press, Totowa, NJ.

**Practical(s)**

1. Biological Databases and records and file format
2. Data retrieval using entiez search
3. Homology search-BLAST/FASTA
4. Multiple sequence Alignment
5. Primer Designing
6. Identification of Gene/EST using different tools/software