

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