

ELECTIVE – IV - 4. BIOINFORMATICS

Unit I

Molecular Biology, Gene Structure and Information Content, Molecular Biology Tools, Genomic Information Content, Data Searches and Pairwise Alignments, Gaps, Scoring Matrices, Needleman and Wunsch Algorithm, Global and Local Alignments, Database Searches.

Unit II

Patterns of Substitution Within Genes, Estimating Substitution Numbers, Molecular Clocks, Molecular Phylogenetics, Phylogenetic Trees, Distance Matrix Methods.

Unit III

Character-Based Methods Of Phylogenetics, Parsimony, Ancestral Sequences, Searches, Consensus Trees, Tree Confidence, Genomics, Prokaryotic Gene Structure, Gene Density, Eukaryotic Genomes, Gene Expression.

Unit IV

Protein and Rna Structure Prediction, Polypeptic Composition, Secondary and Tertiary Structure, Algorithms For Modeling Protein Folding, Structure Prediction

Unit V

Proteomics, Protein Classification, Experimental Techniques, Ligand Screening, Post-Translational Modification Prediction.

Text Book:

"Fundamental Concepts of Bioinformatics" - D. E. Krane and M. L. Raymer - Pearson Education - 2003.

.References Book:

- 1."Introduction to Bioinformatics" - T. K. Attwood and D. J. Parry-Smith - Pearson Education - 2007.
2. "Biostatistical Analysis" - J. H. Zar - Fourth Edition - Pearson Education - 1999 (Fifth Edition about to be released in 2010).