

# BIOINFORMATICS

## **Bioinformatics – an overview**

Introduction, objectives of bioinformatics, kind of data used, information molecules, basic structures of nucleic acids, DNA ,RNA, DNA sequencing and polymerise chain reaction(PCR), proteins structure, functions, protein folding and characterization.

## **Biological Databases**

Introduction, types of databases, nucleotide and protein sequence database, major bioinformatics databases, Introduction to biostatics, data integration, data analysis. Operating systems (LINUX, UNIX), HTML, XML, CML, BSML, etc,.

## **Sequence analysis**

Models for sequence analysis, methods for alignment (Dot matrices), methods for optimal alignment (gap penalties and storing matrices), tools for sequence alignment – Fasts, BLAST, PSI –blast, Multiple Sequence Alignment(MSA) – tool and applications.

## **Phylogenetic analysis**

Phylogenetic trees, distance matrix (MD) and character based methods, gene prediction tools , gene mapping, DNA sequencing, algorithms for alignment of sequencing fragments , DNA micro arrays.

## **Proteomics**

Proteomics analysis, tools for proteome analysis, different structural proteins, protein classification, methods of structure prediction (known folds and unknown folds), protein function prediction, metabolic pathways , gene networks their properties and analysis.

## **BOOKS RECOMMENDED**

1. Introduction to bioinformatics : Attwood.
2. Bioinformatics sequence and genome analysis – David W. Mount
3. Bioinformatics- concept, skills and applications – S.C.Rastogi
4. Recent advances in Bioinformatics- Irfan K. Khan.