

**CORE COURSE -IX BASIC BIOINFORMATICS**

**UNIT – I**

Bioinformatics – An overview, Definition & History; Information Networks – Internet in Bioinformatics – Bioinformatics databases & tools on the Internet.

**UNIT – II**

Proteins – Amino acids – Peptide bond — Levels of protein structure -  $\alpha$ -helix,  $\beta$ -sheet and  $\beta$ -turns – Ramachandran Map - Super secondary structures – Domains - quaternary structure - DNA and RNA structure - Watson and Crick model - A, B and Z forms of DNA - RNA secondary structure.

**UNIT – III**

Biological Sequence analysis – Pairwise sequence comparison – Sequence queries against biological databases – BLAST and FASTA - Multiple sequence alignments - Phylogenetic alignment.

**UNIT - IV**

Protein structure visualization tools – RasMol, Swiss PDB Viewer - Structure – Classification, alignment and analysis – SCOP, CATH, FSSP.

**UNIT - V**

Genomics and Proteomics – Sequencing genomes– Genome databases on the web.

**Reference Books**

1. C.S.V Murthy, *Bioinformatics*, Himalaya publishing house, 2003
2. S.C.Rastogi, N.Mendiratta and P.Rastogi, *Bioinformatics – Concepts, Skills & Applications*, CBS Publishers & Distributors, 2003.
3. T.K. Attwood and D.J. Parry-Smith, *Introduction to Bioinformatics*, Pearson Education Ltd., New Delhi (2004).
4. D.R. Westhead, J.H. Paris and R.M. Twyman, *Instant Notes: Bioinformatics –* Viva Books Private Ltd, New Delhi (2003).
5. Arthur M. Lesk, *Introduction to Bioinformatics*, Oxford University Press, New Delhi (2003).
6. D. Higgins and W. Taylor (Eds), *Bioinformatics- Sequence, structure and databanks*, Oxford University Press, New Delhi (2000).