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B.Sc. Microbiology (CBCS PATTERN) – Proposed curriculum

Semester-6

MB-ES-601: BIOINFORMATICS
(THEORY)

TOTAL HOURS: 60

CREDITS: 2

Unit 1

No. of Hours: 15

- A. Introduction to Bioinformatics , Aim, Tools, & Scope of Bioinformatics, Area of Bioinformatics,
- B. Introduction to Bioinformatics and Biological Databases
Biological databases - nucleic acid, genome, protein sequence and structure, gene expression databases, Database of metabolic pathways, Mode of data storage - File formats - FASTA, Genbank and Uniprot, Data submission & retrieval from NCBI, EMBL, DDBJ, Uniprot, PDB

Unit 2

No. of Hours: 15

- A. Sequence Alignments,
Local and Global Sequence alignment, pairwise and multiple sequence alignment. phylogenetic analysis using clustalW.
- B. Protein Structure Predictions : Hierarchy of protein structure - primary, secondary and tertiary structures, modeling Structural Classes, Motifs, Folds and Domains Protein structure prediction in presence and absence of structure template Energy minimizations and evaluation by Ramachandran plot Protein structure and rational drug design

SUGGESTED READING

1. Saxena Sanjay (2003) A First Course in Computers, Vikas Publishing House
2. Pradeep and Sinha Preeti (2007) Foundations of Computing, 4th ed., BPB Publications
3. Lesk M.A.(2008) Introduction to Bioinformatics . Oxford Publication, 3rd International Student Edition
4. Rastogi S.C., Mendiratta N. and Rastogi P. (2007) Bioinformatics: methods and applications, genomics, proteomics and drug discovery, 2nd ed. Prentice Hall India Publication
5. Primrose and Twyman (2003) Principles of Genome Analysis & Genomics. Blackwell