CLUSTER UNIVERSITY,
SYLLABUS FOR BIOINFORMATICS (BIF)
COURSE FOR B.Sc PROGRAM UNDER CBCS
Course: Bioinformatics (BIF) **(Credits: Theory-4, Practicals-2)**

SEMESTER III:

Course Title: Bioinformatics and Computational Biology

Unit-I

Introduction to Bioinformatics, Importance of Bioinformatics. Relationship of Bioinformatics with molecular Biology. Applications of Bioinformatics, Bioinformatic Resources- NCBI, EBI, ExPASy, Entrez, PBD, SWISSPROT, TREMBL.

Unit II

Detailed Introduction of Biological Databases; Nucleic Acid Database (EMBL), Protein Sequence Databases (UniProt and PROSITE), Protein Structure Databases (PDB, CATH).

Unit-III

General introduction to gene expression in prokaryotes and eukaryotes, Transcription factors binding site, SNP, EST, STS. Genome Mapping, Gene Prediction, Protein Sequence Analysis, Interpretation of Genetic data.

Unit IV

Introduction to Sequences and Sequence analysis: Sequence alignment, pairwise (BLAST and FASTA Algorithm), and Multiple Sequence Alignment (CLUSTALW), local and global alignment.

Practicals:

1. Browsing and Using advanced features of emails.
2. Downloading and Installing Software's.
3. Hands on session with, SWISS-PDB, NCBI, Genbank, Expasy, and PDB.
4. Information Retrieval from online databases.
5. Primer Designing and Candidate Gene Identification.

Books Recommended:

1. Basic Bioinformatics: S. Ignacimuthu, S.J. Narosa Publishing House.
2. Introduction to Bioinformatics: A Theoretical and Practical Approach.
3. Introduction to Bioinformatics: Tramontano, A Chapman & Hall.
4. Understanding Bioinformatics: Zvelebil, M. and Baum, J.O Taylor and Francis.
5. Introduction to Bioinformatics: Teresa K. Attwood, David Parry-Smith.