IT 705 Elective –II (IT- 723- Bioinformatics)

Unit I: Introduction to bioinformatics: Definition and History of Bioinformatics, Application and research of bioinformatics, finding Bioinformatics data online Bioinformatics, private and future data sources, Meta data Summary and reference systems.

Unit II: Bioinformatics Database: Characteristics and categories of Bioinformatics database, Navigating databases, Information retrieval Systems, Sequence database Nucleotide(primary and Secondary), Protein sequence, Structure Databases: File Formats, Protein Structure, PDB, MMDB, CATH, Other Database Enzyme, MEROPS, BRENDA, Pathway databases

Unit III: Bioinformatics Tools: Need for tools, Industry Trends, Data Mining Tools, Data Submission tools: Nucleotide Sequence, protein Submission tools, Data Analysis tools: Nucleotide Sequence, protein Sequence, Prediction Tools: Phylogenetic trees, Gene prediction, Protein Structure and Function prediction, Modeling Tools: 2D and 3D Protein Modeling.

Unit IV: Bioinformatics Algorithms: Classification of Algorithms, Biological Algorithm, Sequence Comparison Algorithm, Substitution Matrices Algorithms, Sequence Alignment Algorithm ,Gene Prediction Algorithm.

Unit V: Bioinformatics Software: Local Alignment Search Tool (BLAST),Purpose of BLAST,BLAST Analysis, Purpose of BLAST II, Scoring Metrics, PAM, BLOSUM, Working of BLAST. Introduction of HMMER, Practical example of HMMER.

References:-

- Orpita Bosu and Simminder Kaur Thukral, ”Bioinformatics Databases,Tools and Algorithms”, Oxford University Press 2007.
- Harshawardhan P.bal, “Bioinformatics Principle and Applications”, TMH.
- Lesk, A.M.2002, “Introduction to Bioinformatics”, Oxford University Press.
- Rastogi, S.C. ,Mendiratta N, “Bioinformatics Concepts,Skill & Applications”, CBS Publishers.
- Claverie, J.M and Notredame C, “Bioinformatics for Dummies”, Wiley Editior.