

SARDAR PATEL UNIVERSITY
Programme: MCA
Semester: V
Syllabus with effect from: June 2015

Paper Code: PS05EMCA04	Total Credit: 4
Title Of Paper: Bioinformatics	

Unit	Description in detail	Weighting (%)
1	BIOMOLECULES Introduction to biomolecules: Carbohydrates, lipids, proteins and nucleic acids Organization of genetic material in prokaryotes and eukaryotes. Different forms of nucleic acids and proteins and their biological functions. Computing in Biomolecules	
2	SEQUENCE ANALYSIS & COMPUTER MODELLING Principles of gene cloning and Genetic Engineering Genome mapping methods: Physical, genetic and molecular markers in mapping (RFLP, RAPD, AFLP, SNP). Automated methods for DNA and protein sequencing. Basic tools for nucleic acid and protein sequence analysis. Assembly of continuous nucleotide sequences. Mathematical models and computational tools for sequence analysis. Multiple sequence analysis and conserved sequence pattern recognition.	
3	GENOMICS From Sequencing Genes to Sequencing Genomes, Sequence Assembly Annotating and Analyzing whole Genome Sequences Functional Genomics, Proteomics Biochemical Pathway Databases, Modeling Kinetics and Physiology	
4	MOLECULAR STRUCTURE AND COMPUTER GRAPHICS Introduction to 2-dimensional & 3-dimensional concepts. Composition basics, Rendering methods & Computer Animation. Introduction to Multimedia and Multimedia Tools, Image Analysis and Processing	
5	WEB APPLICATION DEVELOPMENT FOR BIOINFORMATICS Introduction to WEB, Search Engines, Depositing Data into the Public Databases, Automating Data Analysis, Building Biological Databases, Visualization and Data Mining	
6	BIOINFORMATICS PACKAGES ON DIFFERENT PLATFORMS Windows Platform Based Packages/Software UNIX Platform Based Packages/Software	

Basic Text & Reference Books

- Stephen Misener & Stephen A Krawetz: Bioinformatics, Methods and Protocols: Humana Press
- Cynthia Gibas & Per Jambeck: Developing Bioinformatics Computer Skills: O'reilly
- D. Higgins & W. Taylor: Bioinformatics, Sequence, Structure and Databanks: Oxford University Press.

