

Semester	7
Course	Minor
Paper Code	B4MB230721T
Paper Title	Genomics And Proteomics
No. of Credits	4
Theory / Practical / Composite	THEORY
Minimum No. of preparatory hours per week a student has to devote	4 hours/week
Number of Modules	No modules
Syllabus	Unit 1: Genomics Significance of genome mapping , structural and functional annotation of genome, Different types of genomics (structural, functional and comparative genomics), Different types of genome mapping (linkage mapping and physical mapping) different types of marker (physiological, biochemical and molecular markers), techniques for linkage mapping analysis, numerical analysis of linkage mapping, linkage mapping in bacteria, limitations of linkage map, different types of physical mapping, Radiation hybridization and somatic cell hybridization, FISH techniques, karyotyping, restriction mapping, EST and STS mapping ,DNA fingerprinting techniques Unit 2: Gene therapy Introduction, types of gene therapy; vectors: viral vectors, delivery methods; application in heritable and non-heritable diseases, stem cell therapy. Unit 3: Proteomics Basic overview of proteomics, transition from protein chemistry to proteomics, cellular proteomics. Unit 4: Assays to study protein interactions Immunoprecipitation, pull-downs, Yeast two hybrid system, Fluorescence resonance energy transfer (<i>in vivo</i>) Unit 5: Protein separation and identification 2D gel electrophoresis, brief concept of mass spectrometry for identification. Peptide mass fingerprinting. Use of biomarkers in proteomics and metabolomics.
Learning Outcomes	- Exploring the genetic mapping techniques - Knowing marker analysis - Having the knowledge of gene therapy techniques

	To characterize proteomics techniques	
Reading/Reference Lists	1. Genome 2 T.A Brown 2. Gene therapy 2010 by Mauro Giacca. 3. Principles of Gene Manipulation and genomics: An Introduction to genetic engineering 2007, by Primrose and Twyman.	
Evaluation	Theory CIA: 30 Semester Exam:70	Practical (if applicable) CA: Semester Exam:
Paper Structure for Theory Semester Exam	Full marks 70 Short questions: 10 (each 2 marks) from 12 (10x2=20) Long questions: 5 (each 10 marks) from 7 (5x10=50)	