

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: III
Syllabus with effect from: June 2011

Paper Code: PS03CIGB05	Total Credits: 3
Title Of Paper: Molecular Biology - I	

Unit	Description in detail	Weightage (%)
1	Structure and forms of DNA: B, A and Z forms and the difference between them. Types of DNA: Nuclear DNA, Mitochondrial DNA, Linear DNA, Circular DNA, Cruciform DNA, Repetitive DNA, Satellite DNA and Pseudo genes, Physical properties of DNA.	
2	Structure and types of Plasmid DNA and RNA: mRNA, rRNA, tRNA and snRNA. Basic properties, classification and types of Plasmid DNA and Natural plasmids (Ti, Ri, ColEI, F & R).	
3	Structure and organization of genome in various levels: Prokaryotes, Lower eukaryotes and higher eukaryotes, Cot curve, C value paradox. Genetic code: Biochemical elucidation of codon, properties of genetic code, Wobble hypothesis, cracking of genetic code.	
4	Chromatin structure: DNA binding protein – Histones and non- histones proteins, structure and types of binding motifs with example, Supercoiling of DNA, positive and negative supercoiling. Structure of metaphase chromosome; Packaging of DNA in nucleosome; Nucleosome model.	
	Practical:	
	<ul style="list-style-type: none"> • Isolation of the plasmid DNA from bacteria. • Determination of purity and Estimation of DNA by UV spectrophotometer. • Isolation of genomic DNA from Bacteria. • Introduction to gel electrophoresis. • Standardization and Estimation of DNA by DPA method. • Isolation of RNA. • Standardization and Estimation of RNA by Orcinol method. 	

Basic Text & Reference Books:

- Gene VIII (2004) by B. Lewin. Pearson Education Ltd. London. ISBN: 0-13-123826-4.
- Gene IX (2008) by B. Lewin. John & Bartlett Publishers. London. ISBN: 0-7637-5222-3.
- Molecular biology of The Cell (2008) Alberts et al. Garland Science. ISBN: 978-0-8153-4105-5 /978-0-8153-4105-2
- Genomes 3 (2007) T. A. Brown. Garland Science. New York. ISBN: 0- 8153-4138-5.
- Cell and molecular Biology, Concepts and experiments (2005).Gerald Karp, John Wiley and Sons, Singapore.ISBN :0- 471-65665-8
- The Cell - A molecular approach (2004) Geoferey M. Cooper & Robert E.Hausman. Asm Press Washington. ISBN: 0- 87893- 214-3.
- Cell and Molecular Biology . 8th Edition.(2004), EDP. De Robertis EMF De Robertis Jr. B.I. Publication, India. ISBN : 0-7817-3493-2.
- Biochemistry and Molecular Biology (1997) William H. Elliott & Daphne C. Elliott. Oxford Uni.Press. ISBN: 0- 19-857793-1.
- Essentials of molecular Biology, Malacinski and Freifelder Jones & Bartlett. Publishers; 3rd edition (1998), ISBN-10: 0867208600

