

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: V
Syllabus with effect from: June 2012

Paper Code: PS05CIGB02	Total Credits: 3
Title Of Paper: Recombinant DNA Technology	

Unit	Description in detail	Weightage (%)
1	Introduction to rDNA technology: Steps involved in rDNA technology, isolation of DNA from different sources, concept of restriction and modification, restriction endonucleases, manipulative enzymes used in cloning. Introduction of vector and host. Introduction to generation of genomic and cDNA libraries.	
2	Gene amplification through PCR: Polymerase Chain Reaction: Principle, methodology, primer designing, types of polymerase and factors affecting PCR, advantages, limitations and application PCR. Variants of PCR: Reverse Transcriptase PCR, Real Time PCR, Inverse PCR, anchored PCR, nested PCR, overlap extension PCR, hot start PCR, multiplex PCR, touchdown PCR, ARMS (amplification refractive mutation system) PCR.	
3	Characterization of DNA: Methodology and application of DNA fingerprinting methods (RFLP with probe introduction, RAPD, AFLP, SSR, SCAR, DGGE). Principle methodology and types of DNA sequencing (Sanger-Coulson method, Maxam-Gilbert method, Pyrosequencing)	
4	Application of rDNA technology: Improvement of plant, animals and microbes. Gene therapy, pharmaceutical products and molecular diagnostics, Molecular pharming. Metagenomics, Metabolic engineering.	
	Practical:	
	<ul style="list-style-type: none"> • Isolation of Plant DNA. • Agarose gel electrophoresis. • Isolation of plasmid DNA by Alkaline lysis method. • Isolation of plasmid DNA by Boiling lysis method. • Isolation of RNA. • Quantification of nucleic acids. • Designing of PCR program and primer. • Amplification of gene by PCR. • Performing Ligation reaction. • Performing Restriction digestion. 	

Basic Text & Reference Books:

- Recombinant DNA: Watson et. al.
- Principle of gene manipulation: Old and Primerose
- Gene cloning: T.A. Brown
- Genetic engineering: Sandya Mitra.
- Molecular Biotechnology – Glick
- Applied Molecular Genetics – Roger Miesfeld
- Biotechnology – H. K. Das
- Genetic Engineering- Smita Rastogi and Neelam Pathak
- Animal Biotechnology- P. Ramadaas

