

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

Paper Code: PS05CIGB03	Total Credits: 3
Title Of Paper: Biotech.Principles and Practices	

Unit	Description in detail	Weightage (%)
1	Introduction to Biotechnology: Biotechnology scope and importance:Genome of model organism: E. coli, yeast, Arabidopsis thaliana, C. elegans Techniques in cell fractionation, Isolation of nucleic acid, measuring nucleic acid concentration and purity.	
2	Chemical synthesis of nucleic acid, DNA chip technology and its application, Bioinformatics in Biotechnology. Design and essential requirement for plant and animal tissue culture laboratoryCultivation of mammalian cell in vitro.	
3	Applications of medical and industrial biotechnology Genetic modification in Medicine - gene therapy, types of gene therapy and its applications,Concept and applications Antibody based diagnosis: Monoclonal antibodies as diagnostic tool,Tissue and organ transplantation, xenotransplantation and its applications. Industrial biotechnology: Commercial Production of Microorganisms –enzyme production, use of immobilized cells and enzymes, industrial applications of immobilized enzymes.	
4	General biotechnology and environmental biotechnology: Human genome project -over view, goals, expected scientific benefits from the project. Applications of Transgenic Animals – Mice, Cow, Pig, Sheep, Goat, Bird, Insects. Therapeutic products produced by genetic engineering-blood proteins, human hormones, immune modulators and vaccines, Transgenic animals, Production of proteins of Pharmaceutical value. Applications of biotechnology in agriculture – transgenic plants, genetically modified foods crop improvement, herbicide resistance, insect resistance, virus resistance, plants as bioreactors. Applications of Environmental biotechnology: Bioremediation; types, In situ and Ex situ bioremediation. Xenobiotics; Persistence and biomagnification of xenobiotic molecules; biodegradation of xenobiotics. Biofuel production: biodiesel and bioethanol	
	Practical:	
	<ul style="list-style-type: none"> • Introduction to laboratory instruments and equipments. • Calculations for making reagents and solutions. • Methods for preparation of culture media. • Isolation of DNA from plant. • Isolation of RNA from Yeast. • Estimation of nucleic acid by spectrophotometric method. • Estimation of protein by Bradfoed method. • Estimation of RNA by orcinol method. • Estimation of Sulphate, Nitrate and Phosphate from water sample. 	



Basic Text & Reference Books:

- Molecular Biotechnology-Principles and Practices – Channarayappa, Univeristies press, Hyderabad. ISBN No. 10: 8173715017.
- Biotechnology-Principles and Applications – S. C. Rastogi, Narosa publication, New Delhi. ISBN No. 10: 8173197938.
- Biotechnology – John E. Smith, Cambridge University Press, UK. ISBN No. 0521586941.
- Applications of Biotechnology – R. N. Tripathi et al., Aavishkar Publishers, Jaipur, ISBN No. 9788179102152.

