

**SARDAR PATEL UNIVERSITY**  
**Programme: BSC (GENETICS)**  
**Semester: V**  
**Syllabus with effect from: June 2013**

<b>Paper Code:</b> US05CGEN02	<b>Total Credit: 3</b>
<b>Title Of Paper:</b> Molecular and Microbial genetics	

Unit	Description in detail	Weighting (%)
<b>1</b>	<b>GENETIC RECOMBINATION IN BACTERIA</b> Transformation - Discovery and Mechanism of Transformation, Conjugation-unidirectional gene transfer F <sup>+</sup> , F <sup>-</sup> , HFr, Transduction-Generalized and Specialized, Introduction to viral genetics : Types and life cycle, Modern classification of viruses , Plasmids and Episomes.	
<b>2</b>	<b>RECOMBINATION AND REPAIR OF DNA</b> Models of DNA recombination, Recombination pathways involving “rec” genes, Site specific recombination, DNA repair mechanisms: Photoreactivation, Excision repair, Mismatch repair, Post replication repair, SOS repair. Transposable element- Discovery of transposable elements, simple & complex transposable elements of Bacteria, Structure & molecular basis of AC-DC transposition in Maize, P element of Drosophila, Yeast “Ty” element , Retrotransposons.	
<b>3</b>	<b>REPLICATION AND ‘DNA’ KINETICS</b> DNA Replication in eukaryotes, DNA reassociation kinetics (Cot curve analysis). Different kinetics, unique sequences, moderately repetitive sequences, highly repetitive sequences. Size, organization and expression of mitochondrial & chloroplast genome.	
<b>4</b>	<b>TRANSCRIPTION AND TRANSLATION</b> Transcription in eukaryotes, Transcription & processing of rRNA, tRNA, mRNA, post transcriptional modifications, Translation and post translational modifications	

**Basic Text & Reference Books:**

- Genes IX - Benjamin Lewin, Oxford University Press.
- Molecular Biology of the Gene - Watson & Hopkins, Benjamin/Cummings Publishing Company.
- Molecular Biology of the Cell - Alberts Bray, Lewis, Raff, Roberts & Watson G.S. 3<sup>rd</sup> Ed, Garland Science- Taylor & Francis Inc.
- Cell and Molecular Biology - Concept & Experiments – Gerald Karp. 6<sup>th</sup> Ed, John Wiley & Sons.
- Genetics – Klug & Cummings. 4<sup>th</sup> Ed, Lightning Source Inc.
- Principles of Genetics – D. Peter Snustad & Michael J. Simmons, John Wiley & Sons. Inc.

