

SARDAR PATEL UNIVERSITY
Programme: BSC (GENETICS)
Semester: III
Syllabus with effect from: June 2012

Paper Code: US03CGEN01	Total Credit: 3
Title Of Paper: Cell Molecular Biology and Genetics	

Unit	Description in detail	Weighting (%)
1	CELL CYCLE, MITOSIS, MEIOSIS Structure and organization of prokaryotic (Bacterial cell) and eukaryotic cell (Plant cell and animal cell), The Cell cycle (G, M, S Phases), Mitosis: Stages and Significance of mitosis, Meiosis: Stages, Genetic recombination and Significance of meiosis, Gametogenesis and fertilization in plants and animals.	
2	ULTRA STRUCTURE OF PLASMA MEMBRANE Different models to explain membrane structure - Danielle Davidson model, Robertson model and fluid mosaic model, Fluidity of the membranes Membrane lipids, membrane proteins and carbohydrates, Cell recognition, cell adhesion and cell junction in eukaryote, Membrane excitability in animals, neurotransmission and ion channels, vesicular transport and membrane fusion	
3	CELL ORGANELLES: ULTRA STRUCTURE Nucleus - Ultra structure & functions of nuclear envelope, nucleolus, chromatin, chromosome. Association between maternal and paternal chromosomes Chromosome theory of inheritance, Specialized chromosomes - salivary gland chromosome, lampbrush chromosome, Origin, ultrastructure and function of mitochondria and Endoplasmic reticulum, Origin, ultrastructure and function of chloroplast, Organelle genome (chloroplast & mitochondria)	
4	STRUCTURE OF NUCLEIC ACID Chemical basis of heredity (DNA as genetic material) Griffith's experiment on transformation, Experiment of Avery, McCleod and MaCarty Experiment of Harshey and Chase, Chemical basis of heredity (RNA as genetic material), Experiment on TMV virus - Frankel, Conrat and Singer, Nucleoside, nucleotide and polynucleotide DNA double helix, Different forms of DNA Biological properties of DNA, Supercoiling (solenoid model) and Packaging of DNA, RNA, its types and Functions [Genetic RNA (Viral RNA), Non genetic RNA (r RNA, t RNA and m RNA)]	

Basic Text & Reference Books:

- Fundamentals of Genetics - B.D. Singh, Kalyani Publishers.
- Genetics - Strickberger 3rd Ed. Prentice Hall of India Pvt. Ltd.
- Principles of Genetics – D. Peter Snustad & Michael J. Simmons, John Wiley & Sons. Inc
- Cell Biology, Genetics, Molecular Biology, Evolution & Ecology - Verma & Agarwal, S. Chand & Company Ltd.
- Genetics - Peter J. Russel 5th Ed. Benjamin Cummings Publishing Company
- Genetics - P.K. Gupta 3rd Ed. Rastogi Publications.
- Molecular Biology of the cell - Bruce Alberts 5th Ed. G.S. Garland Science- Taylor & Francis Inc.
- Cell biology - Satyeshchandra Roy and K. K. De
- Introduction to Genetics - Daniell L. Hartl & Elizabeth W. Jones 7th Ed. Jones & Bartlett Publishers.

