

III SEMESTER

Hard core

MBH- 501: Molecular Biology

52 h

UNIT- I

(13 h)

Definition, concepts: genes, chromosome, genetic code, prokaryotic and eukaryotic genomic organization structure and types of nucleic acids. **Central Dogma of Molecular Biology:** transcription and translation in prokaryotes and eukaryotes. Genetic recombination: transformation, transduction & conjugation. Organelle DNA- mitochondrial, chloroplast, **Bacterial genome.**

UNIT- II

(13 h)

Replication enzymes, factors involved in prokaryotic and eukaryotic Initiation, Elongation and termination of replication, Transcription, DNA proof reading, Activators and inhibitors of replication. Enzymes: activators, transcription factors, prokaryotic and eukaryotic promoters. Post transcriptional modifications- splicing, adenylation, capping, polyribosomes, polycistronic and monocistronic mRNA, Transcriptional inhibitors, **Translation and Post Translation modifications.**

UNIT- III

(13 h)

DNA damage repair mechanisms: Photo reactivation, Excision, Recombinant, SOS & Mismatch repair. Gene regulation in prokaryotes and eukaryotes: operon concept, catabolic repression, control by attenuation. Constitutive and Induced Gene expression. Protein splicing, Inter and Intracellular Protein translocation.

UNIT- I V

(13 h)

Molecular Biology of Cancer: Mechanism of transformation of cells, Physical and chemical carcinogens, role of carcinogens & oncogenes in cancer, Oncogene proteins- Protein Kinases, growth factors, the *ras* proteins, Tumor repressor genes, Protein Kinases and transformation. Viral oncogenes: Structure & detection of integrated viral DNA.