**MID –I SYLLABUS**

**III B.** **Sc.** **BIOTECHNOLOGY**

**SEMESTER** **V**

**BTT- 501: MOLECULAR** **BIOLOGY**

**Unit I**

**Genome Structure:**Watson and Crick model of DNA; Genome organization with specific reference to prokaryotic and eukaryotic genomes; Genome size. Concepts of Genetic Material, Gene, Chromosome and Genome. Experiments to prove DNA as genetic material (Griffith experiment, Hershey- Chase experiment)

**Unit** **II**

**DNA** **Replication**:Enzymology of replication (DNA polymerase I, pol II and III, helicases, topoisomerases, single strand binding proteins, DNA melting proteins, primase. Proof of semiconservative replication, Replication origins, initiation, elongation, and termination. Rolling circle replication of DNA

**Unit III**

**Transcription :**Enzymatic synthesis of RNA: Basic features of transcription, structure of prokaryotic RNA polymerase (core enzyme and holo enzyme, sigma factor ), concept of promoter ( Pribnow box,10 and -35 sequences )

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 **BTT- 601: rDNA** **TECHNOLOGY (Elective Theory)**

**Unit I**

**Restriction and Modification**. Classification of restriction endonucleases. Enzymes used in molecular cloning; Polymerases, ligases, phosphatases, kinases and nucleases; Advanced Molecular biology techniques, Electrophoresis and Blotting techniques.

**Unit II**

**Cutting and joining DNA** (cohesive end ligation, methods of blunt end ligation). Transfection and transformation. Selection of transformed cells. Screening methods (Genetic marker and blue white screening)

**Unit III**

**Cloning vehicles** - Plasmid, Bacteriophage, Construction of genomic libraries.