

**Theory**

**Chromatin**, heterochromatin, euchromatin, chromosome structure with reference to coiling and nucleosome during different phases of cell cycle,

**DNA physical and chemical structure**, characteristics of DNA,

**DNA replication** (mechanism, DNA replication in prokaryotes specially with reference to variety of DNA polymerases and other proteins involved, DNA replication in Eukaryotes with special reference to DNA polymerases, concept of Replicons etc.), DNA repair,

**Transcription** (variety of RNA and their characteristics, synthesis of mRNA, rRNA and tRNA with special reference to enzymes, involved, RNA splicing, split genes, concept of Ribozymes and posttranscriptional processing), Genetic code, point mutations,

**Translation** (with reference to the specific role of Ribosomes, various factors, and posttranslational processing),

**Regulation of Gene Expression** (enzyme induction, enzyme repression, role of promoter and operator to be elucidated taking examples of Lac operon and Trip Operon, Gene Regulation in Eukaryotes with reference to elaborate promoter and diverse transcription factors involved, concept of examples of Transcriptional Regulation and Translational Regulation).

**Nuclear Envelope**, Nucleolus

**Practicals**

Histochemistry of tissues, preparation and study of tissue structure; Extraction of DNA (bacterial); Minipreparation of plasmid DNA; Restriction digestion of plasmid DNA

**Books Recommended:****Text Book**

1. DeRobertis and DeRobertis Cell And Molecular Biology, 8 Ed., Publisher: Lippincott Williams and Williams (2008)

**Books Recommended:**

2. Albert, B., Bray, D., Lewis, J., Raff, M. et al. 2002. Molecular Biology of the cell 4th Ed. Garland publishing Inc. New York.
3. Karp G. 2009. Cell and Molecular Biology Wiley; 6 Ed., ISBN-10: 0470483377
4. Harvey Lodish et al. 2000. Molecular Cell Biology 4th Ed. W.M. Freeman, New York.
5. Fobert F. Weaver. 2005. Molecular Biology 3rd Ed. The McGraw Hill companies Inc. International Ed.
6. Bernard R. Glick and Jack J. Pasternate. 1994. Molecular Biotechnology: Principles and applications of Recombinant DNA. ASM press, Washington, D.C., USA.