

**Course Paper**  
**Pre-Ph.D (Biotechnology)**

**Unit I.**

Chromatin, Histones, Nucleosome, Nucleosome Structure, Chromatin template and higher order chromatin organization, Histone H1 and the compaction of nucleosomal arrays.

**Unit II.**

Modulation of Chromatin Structure, ATP dependent chromatin remodeling, Histone modifications and the enzymes involved (Acetylation, Methylation, Phosphorylation and Ubiquitination).

**Unit III**

Genome wide analysis of histone modifications, Cross-talk between histone modifications, Histone Code hypothesis, DNA repair in context of chromatin, Interplay of DNA methylation and histone modifications, Bivalent chromatin marks.

**Unit IV**

Epigenetics, Chromatin Boundaries: *S. cerevisiae* Silencing, *S. pombe* Centromeric Heterochromatin, RNAi-directed Silencing. Heterochromatin localization and its role in gene regulation, genome organization and disease connection.