Bio-chemistry BC1EDSE616

Semester-VI

Subject Code: DSE-1B **6 Credits (4+2)**

Course Title: Molecular Biology **4 credits**

Unit I: DNA Replication

DNA replication in prokaryotes- experimental evidence for semi conservative replication. DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication, inhibitors of DNA replication.

Unit II: Transcription

RNA polymerase, promoter, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse transcriptase, post transcriptional processing of RNA in eukaryotes.

Genetic code: Basic features of Genetic code, biological significance of degeneracy, Wobble hypothesis.

Unit III: Mechanism of translation

Ribosome structure, A and P sites, Mechanism of Translation in prokaryotes Charging of tRNA, f-met-tRNA, initiator codon, Shine-Dalgarno consensus sequence (AGGA) formation of 70S initiation complex, role of EF-TU, EF-Ts, EF-G and GTP, non-sense codons and release factors, RF1 and RF2.

Unit IV: Regulation of gene expression in prokaryotes

Enzyme induction and repression, operon concept, Lac and Trp operon.

Restriction endonucleases, vectors, plasmids, cosmids, Brief steps in DNA cloning. Applications of recombinant DNA technology.

Laboratory Course **2 Credits**

1. Estimation of DNA by Diphenylamine method.
2. Extraction of RNA and its estimation by Orcinol method.

3. Denaturation of DNA, hypo- and hyperchromacity.
4. Agarose Gel electrophoresis of DNA.
5. Demonstration of PCR.

Books Recommended

1. Molecular & Cell Biology by Lodish
2. Molecular Biology by Robert Weaver
3. Laboratory manual of Biochemistry and Biotechnology by Syed Eazaz Hussain Rizvi