CBO 3002: MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Unit-I Molecular biology-I

1. Molecular organization of Eukaryotic DNA: Double helical form of DNA and RNA, Alternate forms of DNA-B, C & Z.
2. Replication of DNA and enzymes involved in replication.
3. Transcription: RNA polymerases, regulation of transcription in prokaryotes and eukaryotes.
4. Genetic code: Deciphering genetic code, properties of genetic code, initiation and termination codons, mutation and genetic code, wobble hypothesis, new genetic codes, second genetic code, overlapping and split genes.

Unit-II Molecular biology-II

1. Translation: Process of protein synthesis.
2. Gene structure and expression: Gene vs allele, a new concept of Allelomorphism, fine structure of gene, cistron, recon and muton, regulation of gene expression in prokaryotes and eukaryotes.
3. Genetic control of cell division: Regulation of the mitotic cell cycle in eukaryotes, cancerous cells, tumor inducing viruses (viral oncogenes), protooncogenes and cellular oncogenes, cancer as the end product of the multistep process.
4. Brief account of human genome project.

Unit-III Biotechnology-I

Recombinant DNA technology:

a. Gene cloning principles an technique
b. Construction of Genomic/c DNA Libraries
c. Choice of vectors
d. DNA synthesis and sequencing
e. Restriction enzymes
f. Polymerase chain reaction (PCR)
g. DNA finger printing

Unit-IV Biotechnology-II

1. Transgenic plants for crop improvement in Wheat, Rice and resistance to herbicides, insecticides, virus and other diseases and hybridoma technology.
2. Transformation of chloroplast (Cp) genome in higher plants (using *Agrobacterium* and partical gun).
3. Clonal propagation, artificial seeds, germ plasm storage and cryo preservation,
4. Production of hybrids and somatoclones, production of secondary metabolites and natural products, applications.