Subject Code : CCN3X8

CORE COURSE VIII – GENETIC ENGINEERING OF MICROBES (r-DNA Technology)

Unit I

Gene cloning principles: Vectors general principles- replication mechanism, segregation incompatibility etc. Plasmids, Phages, ssDNA phages, cosmids, YACs. Enzymes used in gene manipulation – restriction enzymes, DNA polymerases, reverse transcriptases, ligases, polynucleotide kinases, alkaline phosphatases ande nucleases.

Unit II

Techniques for traqnsfer of DNA into cells - transformation, transduction, electroporation, microinjection etc.

Unit III

Cloning strategies – Genomic libraries, cDNA cloning, subcloning, shotgun cloning, cloning in E.coli, Bacilli and yeast.

Unit IV

Recombinant clones: Methods foe selsction and screening of recombinant clones; Detection of rDNA and its products: Site directed mutagenesis of cloned genes; DNA sequencing by oxy, deoxy and chemical methods.

Unit V

Applications of Biotechnology; cloning in plants and animals. Applications of genetic engineering in medicine, agriculture, veterinary and industry.

Unit VI

Safety aspects of recombinant DNA technology: Intellectual Property rights (IPR) and Patenting procedures.