

CORE COURSE – XI (CC) – MOLECULAR BIOLOGY

UNIT – I

Nucleic acids: Structure of DNA and RNA, Types and forms – DNA, t-RNA, r-RNA, m-RNA – Definition and functions.

UNIT – II

Vectors – plasmids, phages and cosmids, Ti-plasmid, pBR322, pSC101, pUC. Structure and assay methods.

UNIT – III

Enzymes – Nucleases, ligases, polymerases, DNA modifying enzymes, Topoisomerases – their uses and applications.

UNIT – IV

Gene and its manipulation techniques – Definition of a gene, structure, cloning techniques, genomic library, C-DNA, expression systems. Gene rearrangement by RNA and DNA splicing.

UNIT – V

Nucleic acid and protein hybridization technique – Southern, Northern and Western methods of hybridization. DNA amplification techniques – PCR. DNA fingerprinting and its applications.

Reference:

- Blackburn CM, Gait MJ. (1996). Nucleic acids in Chemistry and Biology – Oxford University Press.
- Eckstein F, Lilley D.M. (1996). Catalytic RNA – Springer – Verlag.
- Eckstein F, Lilley DM. (1992). Nucleic acids and Molecular Biology – Springer – Verlag.
- Freifelder D. (1991). Molecular Biology. Narosa Publishing Home
- Friedberg EC, Walker GC, Siede W. (1995). DNA repair and Mutagenesis. ASM press.
- George M. Malacinski. And David Freifelder. (1998). Essentials of Molecular Biology 93rd edition). Jones and Bartlett publishers, UK.
- James D. Watson. Michael Gilman. Jan Witkowski and Mark Zoller. (2001). Recombinant DNA. Scientific American Books, New York.
- Lewin, B. (2000). Genes VII. Oxford University press.
- Lodish, H, Baltimore D, Berk A, Zipursky SL, Matsudaira P, Darnell J. (1995). Molecular Cell Biology. Scientific American Books.
- Maloy S.R, Cronan Jr. JE, Freifelder D. (1994). Microbial Genetics. Jones and Bartlett Publishers.
- Michael Blackburn and Michael J. Gait. (1996). Nucleic acids in chemistry and Biology. (2nd edition). Oxford University press.
- Old, R.S. and Primrose, S.B. (1989). Principles of Gene Manipulation, 4th Ed., Blackwell Scientific Publications, London.
- Richard M. Twyman. (2003). Advanced Molecular Biology (1st edition). Viva Books private Ltd, New Delhi.