

**Biotechnology
(Code No. 045)**

DELETED PORTIONS CLASS XI

- **Under Unit I: Biotechnology: An Overview**

- **Chapter 1**

Biotechnology: An Overview: Public Perception of Biotechnology, Biotechnology in India and Global Trends

- **Under Unit II: Molecules of Life**

- **Chapter 1**

Bio-molecules- Building Blocks: Sphingosine, Biochemical Transformations

- **Under Unit III: Genetics and Molecular Biology**

- **Chapter 1: Concepts of Genetics**

Gene Interaction, Sex-Linked Inheritance, Extra nuclear Inheritance, Quantitative Inheritance, Genes at the Population Level

- **Chapter 2: Genes and Genomes: Structure and Function**

Regulation of Gene Expression, DNA Repair, Genome Organization

- **Under Unit IV: Cells and Organisms**

- **Chapter 1: The Basic Unit of Life**

Tissues and Organs, Stem Cells, Biodiversity

- **Chapter 2: Cell Growth and Development**

Gaseous Exchange, Internal Transport, Maintaining the Internal Environment, In vitro Fertilization, Animal and Plant, Development, Programmed Cell Death, Defense Mechanisms in Plants

- **Practicals**

1. Recording practical results and safety rules in the laboratory
2. Determination of bacterial growth curve
3. Isolation of milk protein (Casein)
4. Study of various stages of mitosis and calculation of mitotic index
5. Preparation of karyotype

DELETED PORTIONS CLASS XII

- **Under Unit V: Protein and Gene Manipulation**

- **Chapter 1: Recombinant DNA Technology**

Hybridization techniques, DNA library, Site-directed Mutagenesis

- **Chapter 2: Protein Structure and Engineering**

3-D shape of proteins, Purification of proteins

- **Chapter 3: Genomics, Proteomics and Bioinformatics:**

Introduction, Genome Sequencing projects, History of bioinformatics, Sequences and nomenclature.

- **Under Unit VI: Cell Culture and Genetic Manipulation**

- **Chapter 1: Microbial Cell Culture and its Applications:**

Scale-up of microbial process, Biosafety issues in microbial technology

- **Chapter 2: Plant Cell Culture and Applications**

Gene transfer Methods in plants

- **Chapter 3: Animal Cell Culture and Applications**

Characterization of cell lines, Methods of gene delivery into cells, Scale-up of animal culture process, Tissue engineering

- **Practicals**

1. Isolation of genomic DNA (CTAB method)
2. Bacterial transformation using any plasmid
3. Restriction digestion of plasmid DNA & its analysis by gel electrophoresis