CBSE Syllabus

Class XII

BIOTECHNOLOGY

tutorialspoint

SIMPLY EASY LEARNING

www.tutorialspoint.com

https://www.facebook.com/tutorialspointindia https://twitter.com/tutorialspoint

BIOTECHNOLOGY

Course Structure

Units	Topics	Marks
V	Protein & Gene Manipulation	40
VI	Cell Culture & Genetic Manipulation	30
Practical		30
Total		**100**

Course Syllabus

Unit V: Protein and Gene Manipulation

Chapter 1: Recombinant DNA Technology

- Introduction
- Tool of rDNA technology
- Making rDNA
- Introduction of recombinant DNA into host cells
- Identification of recombinants
- Polymerase chain reaction (PCR)
- Hybridization techniques
- DNA library
- DNA sequencing
- Site-directed mutagenesis

Chapter 2: Protein Structure and Engineering

- Introduction to the world of proteins
- 3-D shape of proteins
- Structure-function relationship in protein

- Purification of proteins
- Characterization of proteins
- Protein based products
- Designing proteins (protein engineering)

Chapter 3: Genomics and Bioinformatics

- Introduction
- Genome sequencing projects
- Gene prediction and counting
- Genome similarity
- SNPs and comparative genomics
- Functional genomics
- Proteomics
- History of bioinformatics
- Sequences and nomenclature
- Information sources
- Analysis using bioinformatics tools

Unit VI: Cell Culture and Genetic Manipulation

Chapter I: Microbial Culture and Applications

- Introduction
- Microbial culture techniques
- Measurement and kinetics of microbial growth
- Scale up of microbial process
- Isolation of microbial products
- Strain isolation and improvement
- Applications of microbial culture technology
- Biosafety issues in microbial technology

Chapter II: Plant Cell Culture and Applications

- Introduction
- Cell and tissue culture techniques
- Applications of cell and tissue culture
- Gene transfer methods in plants
- Transgenic plants with beneficial traits
- Biosafety in plant genetic engineering

Chapter III: Animal Cell Culture and Applications

- Introduction
- Animal cell culture techniques
- Characterisation of cell lines
- Methods of gene delivery into cells
- Scale-up of animal culture process
- Applications of animal cell culture
- Stem cell technology
- Tissue engineering

Practical Works

List of Experiments

- Isolation of bacterial plasmid DNA and its detection by gel electrophoresis
- Restriction digestion of plasmid DNA and its analysis by gel electrophoresis
- Bacterial transformation using any plasmid
- Data retrieval and data base search using internet site NCBI
- Download a DNA and protein sequence from internet, analyse it and comment on it
- Cell viability assay

- Determination of blood groups
- Estimation of DNA
- Ion-exchange chromatography for proteins
- Reading of DNA sequencing gel to arrive at the sequence
- Estimation of blood glucose by enzymatic method (GOD/POD)
- Project work