

SARDAR PATEL UNIVERSITY
Subject-Biotechnology
COURSE: US04CBT-01
BSc Semester---4
(Three credit course; 3 hours per week)
(Effective from June, 2011)

Unit I: Transcription – Definition, concept of gene, promoter. Initiation, elongation, termination and anti termination and anti termination of transcription. Wooble hypothesis and genetic code Operon concept – lac and trp operon.

Unit II: Translation – An overview of translation in prokaryotes. Initiation, elongation and termination of translation.

Unit III: Restriction-modification system, restriction enzymes, types, nomenclature, properties and examples (ECOR1, BamH1, Sma1).

Unit IV: Artificial plasmids (pBR322 and PUC8). Ligation properties, types and function of DNA ligase and exonucleases.

Unit V: Introduction to antigen-antibody interaction, complement, MHC in brief.

Unit VI: Cells of immune system (T cell, B cell, NK cells, APC). Vaccines-types and their method of production (One example in each).

References:

Biotechnology – Expanding Horizon – B D Singh (1st Edition)
Biochemistry – Harper
Molecular Biology – Weaver (2nd Edition)
Molecular Biology of gene – Watson, Hopkins & Roberts (4th Edition)
Gene Cloning – T A Brown (4th Edition)
Genomics – T A Brown (3rd Edition)
Immunology – Janis Kuby
Principles of Biochemistry – Lehninger and Cocks (4th Edition)
Biotechnology – B D Singh
Elements of biotechnology – P.K. Gupta

SARDAR PATEL UNIVERSITY
Subject-Biotechnology
COURSE: US04CBT-02
BSc Semester---4
(Three credit course; 3 hours per week)
(Effective from June, 2011)

Unit I: Law of inheritance. Mendel's laws of heredity, monohybrid and dihybrid crosses.

Unit II: Extrachromosomal inheritance-Mechanism, coiling of shell in snail, Kappa particles in Paramecium, plastid inheritance, male sterility in plants.

Unit III: Introduction to gene cloning, preparation of competent cells. Construction of recombinant DNA and transformation. Visual selection by antibiotic, insertional inactivation.

Unit IV: Therapeutic cloning (production of TPA) organismal cloning (Dolly the sheep) gene cloning (insulin).

Unit V: Method and significance of embryo, anther, pollen, stem and meristem culture in detail.

Unit VI : Protoplast culture-isolation, purification and culture of protoplast. Protoplast fusion methods, screening and selection of somatic hybrids, cytoplasmic hybrids-methods of fusion and significance of cybrid.

REFERENCES:

Plant tissue culture – Kalyan Kumar De (1st Edition)

Plant tissue culture and organ culture – Reinert and Bajaj (1st Edition)

Animal Cell Culture – Freshney

Biotechnology in crop improvement – Harvinder Singh Chawla (1st Edition)

Plant Tissue culture- Rajdhan

Biotechnology – B D Singh

Genetics – P K Gupta

Cell biology, genetics, molecular biology, evolution and ecology- P.S. Verma and R.S. Agarwal

SARDAR PATEL UNIVERSITY
SY BT Practical Syllabus
Course-US04CBT-03
(Three credit course;6 hours per week)
(Effective from June, 2011)

1. Screening of amylase producing microorganisms from soil
2. Screening of protease producing microorganisms from soil
3. Screening of gelatinase producing microorganisms from soil
4. Isolation of pigment producing bacteria
5. Isolation and characterization of Rhizobia from root nodules
6. Biochemical tests for Micro organisms(*E coli*, and *Bacillus subtilis*)
7. Blood group analysis
8. Alkaline phosphatase assay
9. Estimation of cellulase activity using CMC & filter paper
10. Gram staining
11. Endospore staining
12. Cell wall staining
13. Preparation of MS media
14. Plant embryo culture (monocot & Dicot)
15. Seed exercise to calculate segregation ratio for mono- and di-hybrid crosses.
16. Special types of chromosomes from permanent slide
 - a. salivary gland chromosome
 - b. supernumerary chromosome
17. Separation of amino acids by paper chromatography
18. Separation and identification of sub cellular organelles by differential centrifugation.