

SARDAR PATEL UNIVERSITY
Subject-Biotechnology
COURSE: US03CBT-01
BSc Semester---3
(Three credit course; 3 hours per week)
(Effective from June, 2011)

Unit I: Structure and functions of different forms of DNA (Watson and Crick model), RNA (mRNA, tRNA & rRNA and snRNA).
Unit II: Plasmid DNA –Definition, basic properties,classification, types- natural (Ti. ColE1, F & R).
Unit III: Introduction to immune system, types of immunity (innate and acquired, active and passive, humoral and cell-mediated). Immune response-primary and secondary.
Unit IV: Antigen-Definition, property and classification, epitopes and haptens, Antibody- Definition, structure, type and function, blood groups types, ABO and Rh system.
Unit V: Replication-definition, property and features of prokaryotic DNA replication. Unidirectional and bidirectional replication. Initiation, elongation and termination of replication.
Unit VI: Enzymes and proteins involved in replication. Closed clamp and Rolling Circle model of replication. Significance of replication.

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: US03CBT-02
BSc Semester---3
(Three credit course; 3 hours per week)
(Effective from June, 2011)

Unit I: Plant tissue culture- history, pros and cons of plant tissue culture, sterilization techniques. Composition of MS medium and role of ingredients.

Unit II: Totipotency – introduction to callus growth (batch and continuous). Somatic organogenesis and somatic embryogenesis – an introduction. Introduction to transgenic plants (BT cotton).

Unit III: Animal and cell tissue culture – History, introduction, laboratory requirements, media-artificial and natural, cell culture and cell lines.

Unit IV: Introduction to transgenic animals-technique (through retroviral and microinjection), applications with examples (mice, fish).

Unit V: Biofertilizers-types (bacterial, fungal and algal) and significance. Mushroom cultivation-process and significance.

Unit VI: Biological control of pests and insects. Biopesticides and bioinsecticides. Single cell proteins – production and application.

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-US03CBT-03
(Three credit course;6 hours per week)
(Effective from June, 2011)

1. Study of laboratory instruments(autoclave, microscope, pH meter, incubator, centrifuge, hot air oven, electrophoresis apparatus, transilluminator)
2. Isolation of genomic DNA from *E coli*
3. UV absorption of isolated DNA and spot test
4. Estimation of total reducing sugar from jiggery by Cole's method
5. Extraction of protein by TCA method
6. Oligodynamic action of heavy metals
7. Qualitative and quantitative analysis of soil microflora(TVC)
8. Isolation of bacteria by streak plate method
9. Isolation of bacteria by spread plate method
10. Isolation of bacteria by pour plate method
14. Use of selective and differential media(EMB, Mc Conkey using *E coli*, *Bacillus*, & *Enterobacter*)
15. Effect of antimicrobial agents on growth of Microorganisms