SARDAR PATEL UNIVERSITY
BSc Biotechnology Core Paper I
4 credits(4 lecture/wk)
(Semester---III Code:US03CBIT21
(Title: Fundamentals of Biotechnology)

Unit I

Evidences of DNA as a genetic material (Griffith's experiment; Experiment of Avery, McCleod and MaCarty; Experiment of Harshey and Chase). Composition of DNA-Concept of nucleoside and nucleotides. DNA double helix structure (Watson and Crick model). Forms of DNA(A, B ,Z), Chargaff's rule. Chemical, physical and biological properties of DNA.

Unit II Concept of extra chromosomal DNA (mitochondrial and chloroplast) Plasmid DNA—basic properties, classification, types- natural (Ti, F, R, Col, Ri) artificial (pBR322 and PUC8).Plasmid as a vector.

Unit III-- RNA –Structure and types (t-RNA, m-RNA, r-RNA , sn-RNA, micro RNA, i RNA) properties and functions.RNA as a genetic material and its replication(ss-RNA, ds-RNA). Evidences of RNA as a genetic material. Principle and methods for isolation of RNA. Genetic code, Wooble hypothesis.

Unit--IV-- The Cell cycle (G ,M, S Phases),Mitosis : Stages and Significance of mitosis, Meiosis : Stages, Genetic recombination and Significance of meiosis. Basic concept of cell cycle regulation. Control points in cell-cycle progression. Basic overview of apoptosis and its importance.

References:

Biotechnology – Expanding Horizon – B D Singh (1st Edition)
Biochemistry – Harper
Molecular Biology of gene – Watson, Hopkins & Roberts (4th Edition)
Genomics – T A Brown (3rd Edition)
Principles of Biochemistry – Lehninger and Cocks (4th Edition)
Elements of biotechnology – P.K. Gupta
Text book of Biotechnology—R C Dubey

SARDAR PATEL UNIVERSITY
Biotechnology Core Paper II
4 credits(4 lecture/wk)
(Semester---III Code:US03CBIT22
(Title: Microbial Biotechnology)

Unit-I-- Major groups of microorganisms--(bacteria, fungi, viruses) and their characteristics. Principles of microbial control--physical agents(heat radiation osmotic pressure and filtration)and chemical agents(phenol, halogens, surfactants, alcohols and heavy metals).

Unit--II Sources of industrially important microbes and their methods of isolation. Crude and synthetic medium; molasses, corn steep liquor, sulphite waste liquor, whey, yeast extract and protein hydrolysate. screening of bacterium (primary and secondary).Introduction to strain improvement.

Unit-III- Fermentation (definition), batch and continuous fermentations. Production of industrially important enzymes (protease, amylase and gelatinase) from microorganisms. Introduction to fermented food and (cheese, yogurt &bread) microbial derived food products--probiotics.

Unit IV Biofertilizers-types (bacterial, fungal and algal) and significance. Mushroom cultivation-process and significance. Single cell proteins –production and application. Single cell oil -production and significance. Introduction to Biopesticides , Bioinsecticides and Bioplastic.

References:

Microbiology by Pelzar
Industrial microbiology-Whitaker
Industrial microbiology-A H Patel
General microbiology- Frobisher

SARDAR PATEL UNIVERSITY

SYBSc Biotechnology Practical Syllabus
Course-US03CBIT23
(Two credit course;4 hours per week)
(Effective from June, 2019)

1. Study of lab instruments (Centrifuge, spectrophotometer UV and visible)
2. DNA estimation by DPA method
3. RNA estimation by orcinol method
4. Protein extraction by TCA method
5. Protein estimation by Folin's method
6. Study of mitosis in onion root tips
7. Study of meiosis in floral bud
8. Test to check cell/embryo viability

SYBSc Biotechnology Practical Syllabus
(Two credit course;4 hours per week)
(Effective from June, 2019)

1. Gram staining of bacteria.
2. Endospore staining
3. Cell wall staining
4. Isolation of bacteria by streak plate method
5. Isolation of bacteria by spread plate method
6. Isolation of bacteria by pour plate method
7. Serial dilution and qualitative and quantitative analysis of soil microflora(TVC).
8. Screening of amylase producing microorganisms from soil
9. Screening of protease producing microorganisms from soil
10. Screening of gelatinase producing microorganisms from soil
11. Use of differential and selective medium (EMB and Mc Conkey's medium)