

# **Sardar Bhagwan Singh University**

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## **Biotechnology Syllabus**

### **UNIT-1 Microbiology**

Bacteria, Viruses, Fungi, Protozoa.

### **UNIT-2 Industrial Microbiology**

Introduction to fermentation technology: Interaction between biochemical engineering; Microbiology and Biochemistry; Introduction to fermentation processes; Microbial culture; screening of industrially important microbes; Preservation and improvement of industrially important microorganisms.

Biomass separation by centrifugation; filtration; flocculation and other methods; Cell disintegration: Physical; chemical and enzymatic methods; Separation of solid and liquid phases.

### **UNIT-3 Cell Biology**

Tools & Cytological techniques, Cell : Structure & Function, Cell cycle, Division & Cancer, Cell signalling

### **UNIT-4 Biochemistry**

Amino acids and Protein, Carbohydrates & Lipids, Enzymes, Vitamins, Hormones, Nucleic acids

### **UNIT-5 Molecular & Cytogenetics**

DNA : Replication, Transcription, Translation, Protein synthesis, Gene Expression & Regulation of gene expression, Chromosomal basis of Inheritance, Genetic basis of Inheritance (Mendelian & Population Genetics)

### **UNIT-6 Biotechnology**

Proteomics, Genomics (Genome & Human genome project), Genetic engineering, Cloning, Transgenics, DNA Fingerprinting, Plant tissue culture, Plant & Animal breeding, Genetic improvement and disease control, Diagnostics aids

### **UNIT-7 Immunology**

Immune System and Immunity, Antigens and Antibodies, Humoral and Cell Mediated Immune Response and Regulation, Complement system, Cytokines and Major Histo-compatibility Complex.

### **UNIT-8 Plant Classification & Physiology**

Classification of plants, Plant water relations, Photosynthesis, Bacterial photosynthesis and cellular respiration, Plant Growth and mineral nutrients, Reproduction

### **UNIT-9 Ecology**

Organisms and environment, Population, Biotic community and Succession, Ecosystem: Structure and Function, Natural resources and their conservation, Biodiversity & conservation, Microbial ecology, Pollution and global environmental change

### **UNIT-10 Animal Classification & Physiology**

Classification of Animals, Animal tissue, Evolution, Animal respiration & circulation, Animal Nutrition and excretion, Reproduction, Nervous & Chemical coordination in Animals

### **UNIT-11 Environmental Biotechnology**

Biotransformation and biodegradation; Biofertilizers; Biosensors – living biosensors for the management and manipulation of microbial consortia; Role of biotechnology in energy production.