

## **DEPARTMENT OF BIOTECHNOLOGY**

### **SEMESTER- I**

#### **COURSE CODE : BT 101**

#### **Course outcomes:**

- Students develop an understanding of the Cytoskeleton and Cell Membrane & discuss the structure of Microtubules, microfilaments & can differentiate the organisms by its cell structure
- Students can explain various process in cell division
- To understand the basic unit of the organism.
- To differentiate the organisms by its cell structure.
- To know Components of the Cell and their division.
- To explain the arrangement of Genes and their interaction.
- To describe the influence of the environment on gene expression.
- To understand extra nuclear inheritance, linkage & crossing over

## **SEMESTER-II**

### **Biochemistry and Microbiology**

**COURSE CODE : BT 201**

**Course outcomes :**

- After completion of Biochemistry program students will be able to get exposed
- To develop strong theoretical and practical background in fundamental concepts.
- To get insights of multiple important technical areas of Biochemistry.
- To apply contextual knowledge and modern tools of biochemical research for solving problems.
- To give students a generalized idea about microbiology its basic aspects
- Course will provide practical knowledge about different types of bacteria, virus and fungi found in environment
- principles and applications of various types of Microscopy
- Students would know about the contribution of microbiologists, the principle and application of various types of microscopic techniques, and different staining protocols
- Study the morphology of bacteria and detailed account of bacterial cell structure
- Classify microorganisms through Bergey's manual and apply basic knowledge of nutrients required by different microorganisms for their growth
- Students would be able to understand characteristics of viruses, classification and life cycles of viruses
- Description of the structure and Classification, staining, culturing, physiology, of microorganisms

## **SEMESTER-III**

### **MOLECULAR BIOLOGY & RECOMBINANT DNA TECHNOLOGY**

**COURSE CODE : BT3 01**

**Course Outcomes:**

- Learning structural levels of nucleic acids- DNA and RNA and genome organization in prokaryotes and eukaryotes.
- Understanding the concept of Gene and the gene architecture.
- Overview of the central dogma of life and various molecular events
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- Understanding the principles and applications of Polymerase Chain Reaction(PCR).
- Molecular Events of Transcription and processing of transcripts, RNA editing.
- Described the knowledge of recombinant DNA technology
- Understood the tools of gene manipulation and gene transfer
- Knowledge of construction and labeling of molecular probe, construction of genomic library and protein engineering.
- Understood the techniques of recombinant DNA technology and its applications
- Came to know about the techniques and applications of human genome projects
- Molecular Events of Translation leading to protein synthesis and Post translational modification.
- Understanding the regulation of gene expression in prokaryotes using operon concept and Eukaryotes.
- Learn the methods of DNA sequencing and various tools and techniques of molecular biology.

## **SEMESTER -IV**

### **Bioinformatics and Biostatistics**

**COURSE CODE : BT4 01**

**Course Outcomes:**

- Bioinformatics is the science of storing, extracting, organizing, analyzing, interpreting and using information.
- The approaches to the discipline of bioinformatics incorporate expertise from the biological sciences, computer science and mathematics.
- The major in bioinformatics is designed for students interested in molecular biology and genetics, information technologies and computer science.
  
- Bioinformaticists are involved in the analysis of the human genome, identification of targets for drug discovery, development of new algorithms and analysis methods, the study of structural and functional relationships, and molecular evolution.
- Store and Retrieve drug related information using online tools
- Comprehend the utility of tools & databases available in genomic & proteomics
- Understand simple calculations
- Statistics helps to analyze data, interpret, and present information
- Publishing research data
- Calculate; analyze and compare observed data; perform simple sums in proportions and algebraic functions

## **SEMESTER –V**

### **Plant Biotechnology**

**COURSE CODE : BT 601**

**Course outcomes:**

- Learning important milestones in the plant tissue culture.
- Understanding the concepts and principles of Plant tissue culture.
- Learning the techniques of sterilization and monitoring methods of sterilization.
- Learning different pathways of plant regeneration under in vitro conditions - organogenesis and somatic embryogenesis.
- Techniques of establishing cell suspension culture. Synthetic seeds and applications.
- Understanding the techniques of virus elimination – methods of virus indexing. Meristem and Shoot tip culture and Applications.
- Performing procedures for Micropropagation techniques in rose and banana.
- Culturing of reproductive structures - anther, microspores, embryos, endosperm, Ovule and ovary cultures and methods to produce haploids.
- Protoplast isolation, culture and protoplast fusion - applications -. Somaclonal variation - applications.
- Learning methods to conserve germplasm under In vitro. Production of Secondary metabolites production through cell culture.

## **SEMESTER -VI**

### **Animal Biotechnology**

**COURSE CODE : BT 801**

**Course outcomes:**

- Outline the history and structure of animal cell
- To illustrate the techniques, procedure and growth patterns of animal cell culture.
- To describe in vitro applications of animal cell culture
- To distinguish the structure of gametes and its application in animal cell culture.
- To use the assisted reproductive technology practiced in livestock and its applications
- To construct the techniques in production of cloned animals and its applications.
- To predict the ethical, social and moral issues related to cloning
- To Construct techniques involved in transgenic animal technology and its applications
- To apply the applications of Gene therapy for the treatment of various diseases.