

<b>BSc III Sem- Paper III: BIOMOLECULES</b>	
1.	Acquire knowledge about types of Biomolecules, structure and their functions.
2.	Will be able to demonstrate the skills to perform bioanalytical techniques
3.	Apply comprehensive innovations and skills of Biomolecules to Biotechnology field.
<b>BSc IV Sem- Paper IV: MOLECULAR BIOLOGY</b>	
1.	Study the advancements in molecular biology with latest trends
2.	Will acquire the knowledge of structure, functional relationship of proteins and nucleic acids
3.	Aware about the basic cellular processes such transcription, translation, DNA replication, and repair mechanisms
<b>BSc V Sem –Paper V: GENETIC ENGINEERING</b>	
1.	Demonstrate a thorough understanding of the fundamental principles and techniques of genetic engineering
2.	Apply the knowledge of genetic engineering to diverse applications in agriculture, medicine, biotechnology, and environmental science
3.	Perform laboratory procedures and develop practical skills in genetic engineering techniques.
4.	Explain gene expression regulation mechanisms and apply genetic modification methods effectively
5.	Evaluate genetic engineering's ethical, social, and legal implications and propose responsible solutions
6.	Stay updated with recent advancements in genetic engineering, critically evaluate emerging trends, and assess their potential impact on various fields
<b>BSc V Sem –Paper VI: PLANT AND ANIMAL BIOTECHNOLOGY</b>	

1.	. Demonstrate a comprehensive understanding of plant biology, physiology, genetics, and molecular biology
2.	Apply biotechnological tools and techniques used in plant research and agriculture, such as plant tissue culture, genetic engineering and transgenics
3.	Execute plant tissue culture techniques for callus induction, somatic embryogenesis, and micropropagation, and apply them in plant breeding and propagation.
4.	Perform plant transformation methods and demonstrate the ability to introduce foreign genes into plants using different techniques
5.	Apply knowledge about ethical considerations and regulatory frameworks associated with plant biotechnology and genetically modified crops
6.	Understand the biology and characterization of cultured cells, including their adhesion, proliferation, differentiation, morphology, and identification
7.	Gain practical skills in basic mammalian cell culture techniques, measuring growth parameters, assessing cell viability, and understanding cytotoxicity
8.	Learn about germplasm conservation techniques and the establishment of gene banks, along with large-scale culture methods for cell lines
9.	Explore organ and histolytic culture techniques, biotransformation, 3D cultures, whole embryo culture, somatic cell cloning, and the ethical considerations surrounding stem cells and their applications

**BSc VI Sem –Paper VII: IMMUNOLOGY**

1.	Demonstrate comprehension of the underlying structure and function of the immune system and related disorders
2.	Demonstrate an understanding of the role of cells and molecules in immune reactions and responses
3.	Demonstrate technical skills in immunological tools and techniques
4.	Apply the domain-specific knowledge and skills acquired in immunology for innovative therapies and Immunotechnologies

5.	Understand the fundamental concepts of immunity, and the contributions of the organs and cells in immune responses
6.	Realize how the MHC molecule's function and host encounters an immune insult
7.	Understand the antibodies and complement system
8.	Understand the mechanisms involved in the initiation of specific immune responses
9.	Differentiate the humoral and cell-mediated immune mechanisms
10.	Comprehend the overreaction by our immune system leading to hypersensitive conditions and its consequences
11.	Understand unique properties of cancer cells, immune recognition of tumors, immune evasion of cancers

**BSc VI Sem –Paper VIII: BIOPROCESS AND ENVIRONMENTAL BIOTECHNOLOGY**

1.	Exploitation of microorganisms for industrial use and their improvement, and formulation of media for efficient growth and production of microbial or cell-based products.
2.	The design, operation, and specific applications of various bioreactors
3.	Demonstrate a comprehensive understanding of the fundamental concepts and principles of environmental biotechnology
4.	Apply knowledge of biotechnological techniques to address environmental challenges, such as pollution control and waste management
5.	Analyze and evaluate environmental biotechnology case studies, research findings, and real-world applications.
6.	Design and implement biotechnological approaches for environmental remediation, utilizing microbial processes and biodegradation principles
7.	Evaluate the ethical and sustainable aspects of environmental biotechnology practices and make informed decisions regarding their application in environmental conservation
8.	Communicate scientific concepts and research findings related to environmental

biotechnology effectively, both in written and oral forms, to diverse audiences.
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### **Course Outcomes– B.Sc. Biotechnology (SEP) (Autonomous)**

**On successful completion of the course, the students will be able to:**

<b>BSc I Sem- Paper I: CELL BIOLOGY AND GENETICS</b>	
1.	Summarize the concepts in Biotechnology and demonstrate the knowledge acquired in interdisciplinary skills in Cell Biology and Genetics
2.	Identify the basic principles of life, and the cell division
3.	Comprehend the structure of a cell with its organelles
4.	Discuss the chromatin structure and its location
5.	Explain the organization of genes and chromosomes, chromosome morphology, aberration, and genetics
<b>BSc II Sem- Paper II: MICROBIOLOGICAL METHODS</b>	
1.	They learn about principle and application of analytical instruments
2.	Principle and evaluation of Sterilization techniques using different instruments
3.	Preparation of culture media, colony characterization of cultured microorganisms
4.	Differentiating the strains of microorganisms using staining techniques. Evaluating the drinking efficiency of water with MPN test.

### **Course Outcomes– B.Sc. Biotechnology (NEP)**

**(Affiliated to Bengaluru City University)**

**On successful completion of the course, the students will be able to:**

### **Course Outcomes– B.Sc. Genetics (SEP) (Autonomous)**

**On successful completion of the course, the students will be able to:**

<b>BSc I Sem- Paper I: CELL BIOLOGY</b>	
1.	Understand the basic principles of different types of Microscopes and its application
2.	Understand the structure and function of all the cell organelles
3.	Comprehend the mechanism of cell division, cellular aging and cell death and its regulation
4.	Develop comprehensive understanding on the organization of Prokaryotic and eukaryotic chromosome
<b>BSc II Sem – Paper II: CYTOGENETICS</b>	
1.	Understand the Laws of Mendel, gain insight in to various types of gene interaction
2.	Gain knowledge on the principles of Linkage and crossing, analyze the construction of genetic map
3.	Comprehend the phenomenon of extra nuclear inheritance
4.	Gain Knowledge and understand the mechanism of sex linkage and sex determination
5.	Understand analyze various structural and numerical chromosomal aberration

### **Course Outcomes– B.Sc. Genetics (NEP)**

**(Affiliated to Bengaluru City University)**

**On successful completion of the course, the students will be able to:**

<b>BSc III Sem – Paper III: BIOMOLECULES AND MOLECULAR GENETICS</b>	
1.	Describe the structure and function of biomolecules
2.	Appreciate and illustrate the chemical composition of the genetic material and its replication

3.	Describe the process of gene expression in prokaryotes and eukaryotes
4.	Explain the concept of transposition, mutation and DNA repair mechanism
<b>BSc IV Sem – Paper IV: HUMAN GENETICS AND GENETIC COUNSELLING</b>	
1.	Understand the nomenclature of Human chromosome and chromosomal inheritance pattern
2.	Understand cells of immune system, structure of immunoglobulin and role of MHC in transplantation
3.	Understand Prenatal diagnosis method and gene therapy for treating Genetic disease
4.	Appreciate Genetic counselling and steps involved in it
<b>BSc V Sem – Paper V: GENE REGULATION AND DNA REPAIR</b>	
1.	Comprehend various types of DNA repair mechanisms and the associated diseases
2.	Interpret epigenetic gene regulation
3.	Summarise gene expression profile
4.	Comprehend gene expression at various levels
<b>BSc V Sem – Paper VI: PLANT CELL AND TISSUE CULTURE TECHNOLOGY</b>	
1.	Understand the concepts of population and quantitative genetics
2.	Describe Hardy-Weinberg principle and its importance in population genetics
3.	Conceptualise mating patterns, inbreeding coefficient and genetic polymorphism.
4.	Understand molecular evolution in protein and DNA sequences
<b>BSc VI Sem – Paper VII: GENES AND DEVELOPMENT</b>	
1.	Understand the role of genes in early development.
2.	Conceptualize the molecular and cellular mechanisms controlling early development of organisms

3.	Understand the role of the genes in cell differentiation and determination
4.	Relate recent advances in clinical embryology
<b>BSc VI Sem – Paper VIII: POPULATION AND EVOLUTIONARY GENETICS</b>	
1.	Understand the concepts of population and quantitative genetics CO2
2.	Describe Hardy-Weinberg principle and its importance in population genetics
3.	Conceptualise mating patterns, inbreeding coefficient and genetic polymorphism
4.	Understand molecular evolution in protein and DNA sequences