BIOTECHNOLOGY

COURSE OUTCOMES

Bloom's Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create (R, U, Ap, Az, E, C)

SEMESTER I

CELL BIOLOGY , GENETICS AND BIOSTATISTICS			
Sem-I	**Credits: 4**	**Course Code:BIT101T**	**Year/Group: I BtBC/BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Understand cytological architectural of prokaryotic & eukaryotic cell		U
CO2	Differentiate the basic mechanism underlying in cell cycle, cell division and cell death		Az
CO3	Acquire the knowledge of traits inheritance from one generation to another		U
CO4	Gain knowledge of sampling and measures of central tendency, probability and Hypothesis testing		Ap

Title of the CELL BIOLOGY , GENETICS AND BIOSTATISTICS (Practicals)			
Sem-I	**Credits: 1**	**Course Code:BIT101P**	**Year/Group: I BtBC/BtMC HPW: 3**
Course Outcomes			Blooms Level
CO1	Able to identify the stages of cell divisions and solve genetic problems on Mendelian and Non Mendelian inheritance.		U,Az
CO2	Able to solve statistical problems using various hypothesis.		Az

SEMESTER II

MICROBIOLOGY & IMMUNOLOGY			
Sem II	**Credits: 4**	**Course Code:BIT201T**	**Year/Group: I BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Understanding the basics of microbiology and microbial classification		U
CO2	Able to culture different bacteria and know how to preserve them		Az
CO3	Have a comprehensive understanding of antigen-antibody interactions and their relevance in immunology.		U
CO4	Understand and analyze immunoassays effectively in various scientific and biomedical sciences.		Az

MICROBIOLOGY & IMMUNOLOGY(Practicals)			
Sem I	**Credits: 1**	**Course Code:BIT201P**	**Year/Group: I BtBC /BtMC HPW: 3**
Course Outcomes			Blooms Level
CO1	Able to prepare microbiological media, isolate and identify bacteria.		U,Az
CO2	Able to perform immunological tests like blood grouping, single radial immunodiffusion, ELISA.		Ap

SEMESTER III

MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY			
Sem III	**Credits: 4**	**Course Code:BIT301T**	**Year/Group: II BtBC/BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Able tounderstand and explain genome organization, DNA replication. gene expression & regulation in prokaryotes		U
CO2	Have knowledge of gene expression, modification & regulation ineukaryotes		R
CO3	Understand the steps involved in recombinant DNAtechnology.		U
CO4	Able to explain gene transfer techniques and their applications		U

MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY(Practicals)			
Sem III	**Credits: 1**	**Course Code:BIT301P**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Understand and perform the procedure to isolate DNA from bacterial cells.		U
CO2	Identify DNA fragments by performing Agarose gel electrophoresis and perform restriction digestion of DNA.		Az, Ap

SEMESTER - III (SEC-1)

TINDUSTRIAL FERMENTATION			
Sem- III	**Credits: 2**	**Course Code: BITSEC2A**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			
CO1	To understand the production of industrial acids.		
CO2	To distinguish the production of various Biofuels, Microbial insecticides, Flavours and New Antibiotics		
CO3	To analyse the different methods of fermentation and purification processes.		
CO4	To perceive enzyme kinetics, immobilization techniques.		

SEMESTER - III (SEC-2)

IMMUNOLOGICAL TECHNIQUES			
Sem- III	**Credits: 2**	**Course Code: BITSEC2B**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			
CO1	To distinguish the techniques of Immuno diffusion and Immuno Electrophoresis.		
CO2	To understand the Methodology of ELISA, Radio Immuno Assay.		
CO3	To learn the methodology of differential count, separation of Mononuclear cells from human peripheral blood.		
CO4	To identify T & B Cells, Perform HLA typing method.		

SEMESTER IV

BIO INFORMATICS AND BIOSTATISTICS			
Sem IV	**Credits: 4**	**Course Code:BIT401T**	**Year/Group: II BtBC/BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Understand bioinformatics tools, resources and distinguish biological databases.		U,Az
CO2	Compare the Data Retrieval tools and its Utilization, Interpret concepts of phylogeny tree		Az
CO3	Execute measures of dispersion and probability distributions		Ap
CO4	Implement hypothesis testing, analysis of variance and correlations		Ap

BIO INFORMATICS AND BIOSTATISTICS (Practicals)			
Sem IV	**Credits:1**	**Course Code:BIT401P**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Explore, search and retrieve data from various Bioinformatics portals Perform homology sequencing of proteins.		Ap
CO2	Construct various diagrammatic representation of Biological data		Ap

SEMESTER IV (SEC-3)

MOLECULAR MARKERS IN PLANT BREEDING			
Sem- IV	**Credits: 2**	**Course Code: BITSEC4A**	**Year/Group:I BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Understand morphological, cytological, biochemical, genetic markers		U
CO2	Distinguish molecular markers based on hybridisation PCR		R
CO3	Appreciate the use of molecular markers in segregating population and linkage mapping		Ap
CO4	Explain the role of markers in fingerprinting and hybrid testing		Az

SEMESTER IV (SEC-4)

DRUG DESIGNING			
Sem- IV	**Credits: 2**	**Course Code: BITSEC4B**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Identify different drug targets and their validation.		U
CO2	Appreciate the role of Bioinformatics in the analysis of Nucleic acid and proteins.		R
CO3	Grasp the strategies of drug designing, preparation of active compounds.		U,Ap
CO4	Understand the role of drug development and optimization.		U,Ap

SEMESTER V GENERIC ELECTIVE (GE)

BASICS IN BIOTECHNOLOGY			
Sem- V	**Credits: 4**	**Course Code:GES5**	**Year/Group: III BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Illustrate the methods of producing transgenic plants and their applications.		U
CO2	Understand and identify micro-organisms for production of industrial products.		R, U
CO3	Explain and develop animal models for treatment of diseases.		Ap
CO4	Analyse the role of software tools in molecular and evolutionary studies.		Az

PLANT BIOTECHNOLOGY			
Sem- V	**Credits: 4**	**Course Code:(BIT501(A)T)**	**Year/Group: III BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Compare nutritional requirements of tissue culture media for cell suspension culture and organogenesis**.**		**U**
CO2	Develop **synthetics** seeds, somatic hybrids , cybrids and production of haploids.		Ap
CO3	Distinguish the various methods of gene transfer.		Az
CO4	Interpret development of Virus, bacterial and fungal resistance transgenic plants.		Ap

PLANT BIOTECHNOLOGY (Practicals)			
Sem- V	**Credits: 1**	**Course Code::(BIT501(A)P)**	**Year/Group: III BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	**Choose various media for plant tissue culture.**		**Ap**
CO2	**Examine protoplast isolation, Agrobacterium mediated transformation**		**Az**

SEMESTER V

MEDICAL BIOTECHNOLOGY			
Sem-V	**Credits: 4**	**Course Code:BIT501(B)T**	**Year/Group: III BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Explain Human genetics, focusing on inheritance patterns and the analysis of traits through pedigrees**.**		**U**
CO2	Distinguish Chromosomal Disorders, Mitochondrial diseases, Multifactorial and cancer Genetic basis.		**Az**
CO3	Analyze diagnosis techniques for treating human diseases.		**Az**
CO4	Evaluate various therapeutic approaches for treating human diseses.		**E**

MEDICAL BIOTECHNOLOGY (Practicals)			
Sem- V	**Credits: 1**	**Course Code: BIT501(B)P**	**Year/Group: III BtBC /BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Construct karyotyping of normal and abnormal human chromosome set.		**Ap**
CO2	Compare Human pedigree analysis of autosomal and allosomal disorders.		**E**

SEMESTER VI

IPR, BIOSAFETY AND ENTREPRENEURSHIP			
Sem- VI	**Credits: 4**	**Course Code:BIT601T/Project**	**Year/Group: III BtBC /BtMCHPW: 4**
Course Outcomes			Blooms Level
CO1	**Classify types of Intellectual property rights.**		**R**
CO2	**Examine kinds of patents with examples.**		**U**
CO3	**Understand Laboratory Management and Handling of hazardous compounds.**		**U**
CO4	**Develop entrepreneurship skills and product planning and development.**		**Ap,C**

ANIMAL BIOTECHNOLOGY			
Sem- VI	**Credits: 4**	**Course Code: BIT601(A)T**	**Year/Group: III BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	**Illustrate animal cell culture technique, manipulation and applications of cell culture.**		**U**
CO2	**Choose various in vitro techniques in animal improvement.**		**Ap**
CO3	**Assess the role of molecular markers in animal genetics.**		**Az**
CO4	**Develop animal models in understanding disease biologyand drug development.**		**C**

ANIMAL BIOTECHNOLOGY (Practicals)			
Sem- VI	**Credits: 1**	**Course Code:BIT601(A)P**	**Year/Group: III BtBC /BtMCHPW: 2**
Course Outcomes			Blooms Level
CO1	**Utilize animal culture media for isolating cells.**		**Ap**
CO2	**Examine suspension cells and adherent cells.**		**Az**

ENVIRONMENTAL BIOTECHNOLOGY			
Sem- VI	**Credits: 4**	**Course Code:(BIT601T)**	**Year/Group: III BtBC /BtMC HPW: 4**
Course Outcomes			Blooms Level
CO1	Classify types of environmental pollutions.		U
CO2	Identify types of biomass used for bioenergy and biofuels.		U
CO3	Compare the production of various Biofuels.		Ap
CO4	Distinguish types of bioremediations and their applications.		Az

SEMESTER VI

ENVIRONMENTAL BIOTECHNOLOGY (P r a c t i c a l s)			
Sem- VI	**Credits: 1**	**Course Code:BIT601(B)P**	**Year/Group: III BtBC/BtMC HPW: 2**
Course Outcomes			Blooms Level
CO1	Estimate various parameters in polluted water samples.		**Ap**
CO2	Develop microbial bio fertilizers.		**C**