PROGRAMME OUTCOMES of B.Sc (Life Sciences)

PO1	Gain academic expertise and critical thinking capability in the field of their study.
PO2	Analyse data meticulously and draw logical, physical inferences out of it.
PO3	Develop scientific temper and research aptitude through experiential learning.
PO4	Apply the concepts in key areas of science and allied subjects there by enhancing their employability and entrepreneurship skills.
PO5	Develop critical and analytical skills in the identification and resolution of problems within complex changing socio-economic environments.
PO6	Display skills in ethical analysis and decision-making with empathy and respect for core human values.
PO7	Become a responsible citizen who cultivates human values for the formation of an egalitarian society.
PO8	Ability to incorporate lifelong learning and commit to Professional Ethics

PROGRAMME SPECIFIC OUTCOMES OF B.Sc. BTMC

PSO1	Graduates will have a comprehensive understanding of the fundamental concepts in Life Sciences including chemistry.
PSO2	Students apply scientific principles to design, conduct experiments, analyze data to draw meaningful conclusions and able to collaborate with interdisciplinary subjects
PSO3	Students will develop employability and entrepreneur skills by integrating with philosophical Approach across allied sciences

BIOTECHNOLOGY SEMESTER I

Title of the Course: CELL BIOLOGY AND GENETICS			
Sem-I	**Credits: 4**	**Course Code:BIT101T**	**Year/Group: I BtBC/BtMC HPW: 4**
Course Outcomes			
CO1	Understand the cell structure of different organisms.		
CO2	Able to differentiate the cell divisions, Senescence, necrosis and Apoptosis and explain Mendelian inheritance and their deviations.		
CO3	Discuss multiple alleles, penetrance and X-linked inheritance.		
CO4	Describe linkage, Non Mendelian inheritance, mitochondrial inheritance and understand Hardy Weinberg Equilibrium		

Title of the Course: CELL BIOLOGY AND GENETICS (PRACTICALS)			
Sem-I	**Credits: 1**	**Course Code:BIT101P**	**Year/Group: I BtBC/BtMC HPW: 3**
Course Outcomes			
CO1	Able to identify and differentiate the stages of cell divisions		
CO2	Able to solve genetic problems on Mendelian and Non Mendelian inheritance.		

SEMESTER II

Title of the Course: BIOLOGICAL CHEMISTRY AND MICROBIOLOGY			
Sem-II	**Credits: 4**	**Course Code:BIT201T**	**Year/Group: I BtBC /BtMC HPW: 4**
Course Outcomes			
CO1	Identify and explain the Classification, importance and conversion of Biomolecules into Energy.		
CO2	Classify and explain the structure and general characteristics of Microorganisms and distinguish sterilization methods.		

CO3	Distinguish sterilization methods.
CO4	Prepare various Bacteriological, Algal, and Fungal Media.

Title of the Course: BIOLOGICAL CHEMISTRY AND MICROBIOLOGY (PRACTICALS)			
Sem-II	**Credits: 1**	**Course Code:BIT201P**	**Year/Group: I BtBC /BtMC HPW: 3**
Course Outcomes			
CO1	Able to prepare buffers, biochemical solutions		
CO2	Able to prepare and identify microbial cultures in different media		

SEMESTER III

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

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

SEMESTER - III Skill Enhancement Course-1 (SEC-1)

Title of the Course: INDUSTRIAL 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 Skill Enhancement Course-2 (SEC-2)

Title of the Course: 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

Title of the Course: : BIO INFORMATICS AND BIOSTATISTICS			
Sem-IV	**Credits: 4**	**Course Code: BIT401T**	**Year/Group: II BtBC/BtMC HPW: 4**
Course Outcomes			
CO1	To understand bioinformatics tools, resources and distinguish biological databases.		

CO2	Compare the Data Retrieval tools and its Utilization, Interpret concepts of phylogeny tree.
CO3	Execute measures of dispersion and probability distributions
CO4	Implement hypothesis testing, analysis of variance and correlations

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

SEMESTER IV SKILL ENHANCEMENT COURSE- 3(SEC-3)

Title of the Course: MOLECULAR MARKERS IN PLANT BREEDING			
Sem-IV	**Credits: 2**	**Course Code: BITSEC4A**	**Year/Group: II BtBC /BtMC HPW: 2**
Course Outcomes			
CO1	To Understand morphological, cytological, biochemical, genetic markers		
CO2	To distinguish molecular markers based on hybridisation PCR		
CO3	To appreciate the use of molecular markers in segregating population and linkage mapping		
CO4	To Explain the role of markers in fingerprinting and hybrid testing		

SEMESTER IV SKILL ENHANCEMENT COURSE-4 (SEC-4)

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

SEMESTER V GENERIC ELECTIVE (GE)

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

SEMESTER V

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

SEMESTER V

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

SEMESTER V

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

SEMESTER V

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

SEMESTER VI

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

SEMESTER VI

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

SEMESTER VI

Title of the Course: ANIMAL BIOTECHNOLOGY PRACTICALS			
Sem-VI	Credits: 1	Course Code:BIT601(A)P	Year/Group: III BtBC /BtMC HPW: 2
Course Outcomes			
CO1	Utilize animal culture media for isolating cells.		
CO2	Examine suspension cells and adherent cells.		

SEMESTER VI

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

SEMESTER VIs

Title of the Course: ENVIRONMENTAL BIOTECHNOLOGY PRACTICALS			
Sem-VI	**Credits: 1**	**Course Code:BIT601(B)P**	**Year/Group: III BtBC /BtMC** **HPW: 2**
Course Outcomes			
CO1	**Estimate various parameters in polluted water samples.**		
CO2	**Develop microbial bio fertilizers.**		