Department	Biotechnology	SO	CO Description

S No	Course Code	Course Title	CO NO	Description of the Course Outcome	Program Outcomes												PSO	
					1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	17BT1201	CELL BIOLOGY	CO1	Acquire the knowledge of cell and Nuclear Organization	2			2									3	3
			CO2	Compare Cell division and cell cycle	2			2									3	3
			CO3	Acquire the knowledge of tissues and Receptors	2			2									3	3
			CO4	Understand membrane Structure	2			2									3	3
2	17CS1101	Problem Solving and Coumputer Programming	CO1	Illustrate how problems are solved using computers and programming.	1	2									2			
			CO2	Illustrate and use Control Flow Statements in C.	1	2									2			
			CO3	Interpret & Illustrate user defined C functions and different operations on list of data.	1	2									2			
			CO4	Implement Linear Data Structures and compare them.	1	2									2			
			CO5	Apply the knowledge obtained by the course to solve real world problems.	1	2									2			
3	17ME1003	Workshop Practice	CO1	Prepare the different joints using carpentary trade by using wood as raw material	1			1										
			CO2	Prepare the different fits using fitting trade with Ms plates as raw material	1			1										
			CO3	Prepare the different components using Tinsmithy trade by using GI sheet as raw material	1			1										
			CO4	Apply basic electrical engineering knowledge for house wiring practice.	1			1										
			CO5	Install operating system in CPU and Assemble & Disassemble the CPU	1			1										
4	17MT1102	Foundations of Computational Mathematics	CO1	Evaluate mathematical expressions by using different types of operations on numbers.	1			1										
			CO2	Simplify expressions and solve equations & inequations.	1			1										
			CO3	Apply different types of arithmetic expressions to solve given problems.	1			1										
			CO4	Apply methods to find areas, volumes and use graphs to reduce non-linear to linear forms.	1			1										
5	17MT1205	Basic Mathematics	CO1	Apply differential and integral calculus to find maxima & minima of functions, evaluate the integrals and solve the differential equations.	1			1							1			
			CO2	Demonstrate the Fourier series and Laplace transforms.	1			1							1			
			CO3	Describe probability, Random Variables	1			1							1			
			CO4	Explain complex variables, analytic functions and introduction to stochastic process and Algebraic structures.	1			1							1			
			CO5	Practicing the concepts in lab	1			1							1			
6	17PH1001	Engineering Materials	CO1	Understands structure of crystalline solids, kinds of crystal imperfections and appreciates structure-property relationship in crystals.	1													
			CO2	Understands magnetic properties of materials and identifies their role in classification soft & hard magnetic materials having specific engineering applications.	1													
			CO3	Understands thermal and mechanical properties of materials, heat treatment methods for changing the microstructure of materials and responses of materials subjected to load.	1													
			CO4	Understands the role of electronic energy band structures of solids in governing various electrical and optical properties of materials.	1													
			CO5	Apply the knowledge on structure and properties of materials while executing experiments and develop inter disciplinary projects.	1													
7	15ME1002	Engineering Graphics	CO1	Understand the principles of drawing and use of drafting instruments	1				1									
			CO2	Draw engineering curves and scales.	1				1									
			CO3	Draw the projections of points, lines, planes and solids	1				1									
			CO4	Draw the surface sheath of solids by development of surfaces and the sections of Solids.	1				1									
			CO5	Prepare 2D & 3D drawings of solids and their transformations.	1				1									
			CO1	Model the physical laws and relations mathematically as a first order differential equations, solve by analytical and numerical methods also interpret the solution.	2	1												

8	17MT1101	Single Variable Calculus and Matrix Algebra	CO2	Model physical laws and relations mathematically as second/higher order differential equations, solve by analytical method and interpret the solution.	2	1															
			CO3	Obtain the Fourier series expansions of periodic functions and use the series to solve ordinary differential equations.	2	1															
			CO4	Model physical problems mathematically as a system of linear equations and solve them by analytical and numerical methods. Also, determine the nature of Quadratic form using Eigen values.	2	1															
			CO5	Verify the solution of problems through MATLAB.	2	1															
9	17EN1201	Building Blocks for Commmunication Skills	CO1	Improve pronunciation skills and understand the method of identifying antonyms.										3							
			CO2	Apply writing strategies for office/ formal communication										3							
			CO3	Analyze types of reading techniques and improve reading speed.										3							
			CO4	Analyze different cultures and the importance of empathy in cross-cultural communication.										3							
			CO5	Practicing the concepts in lab										3							
10	17CY1001	Engineering Chemistry	CO1	Predict potential complications from combining various chemicals or metals in an engineering setting			2	2													
			CO2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena			2	2													
			CO3	Examine water quality and select appropriate purification technique for intended problem			2	2													
			CO4	Apply polymers, conducting polymers ,green chemistry and nano chemistry to engineering processes			2	2													
			CO5	An ability to analyze & generate experimental skills			2	2													
11	17ME1001	Engineering Mechanics	CO1	Understand the concept of forces and apply the static equilibrium equations.	2	2		2													
			CO2	Analyze co-planar and non co-planar system of forces.	2	2		2													
			CO3	Apply the concept of centroid & centre of gravity to determine moment of inertia.	2	2		2													
			CO4	Analyze the rigid bodies under translation and rotation with and without considering forces.	2	2		2													
			CO5	Understand and analyze the engineering systems with the help of mechanics concept to solve the engineering problems.	2	2		2													
12	17MT1204	Logic and Reasoning	CO1	Apply the fundamental principle of counting and use them to measure the uncertainty in random experiments.	2				2												
			CO2	Apply Venn diagrams to find the conclusion of statements, solve puzzles using binary logic and problems relating to cubes.	2				2												
			CO3	Apply the available models for Data sufficiency & redundancy and interpret it , when given, in tabular and graphical forms.	2				2												
			CO4	Apply the Reasoning techniques to solve problems on arrangements, series, analogies, coding and decoding.	2				2												
13	17GN1003	Basic Engineering Measurements	CO1	Understand the Basic fundamentals of a measurement system.	1		1	1													
			CO2	Understand various Mechanical measuring parameters, and apply different measuring techniques on various mechanical parameters using simulation and experimentation tools.	1		1	1													
			CO3	Understand various Electrical measuring parameters, and apply different measuring techniques on various Electrical parameters using simulation and experimentation tools.	1		1	1													
			CO4	Understand various Electronic measuring parameters, and apply different measuring techniques on various Electronic parameters using simulation and experimentation tools.	1		1	1													
			CO5	Apply the theoretical concepts to measure different parameters.	1		1	1													
14	17GN1204	Coding skills for Engineers	CO1	Apply the concepts of basic programming to solve the basic problems, pattern based problems	2	2															
			CO2	Build solutions for problems on Numbers and array based problems , functions, recursion	2	2															
			CO3	Solve problems solutions for character/string based problems and pointers	2	2															
			CO4	Build solutions to programs on Data structures concepts.	2	2															
			CO5	Ability to analyze the built program.	2	2															
15	17BT2105	Biochemistry	CO1	Understand the role of water and biological buffers in organism's physiology. Acquire the knowledge of structural and biochemical basis of amino acids.	3	2	2	2				3	3				3				
			CO2	Acquire the knowledge of structural evolution of proteins and Understand the biochemical basis of enzyme catalysis.	3	2	2	2				3	3				3				
			CO3	Acquire the knowledge of structural evolution of carbohydrates and lipids and Understand the role of carbohydrates and lipids in cellular physiology and energetic.	3	2	2	2				3	3				3				
			CO4	Acquire the knowledge of structural evolution and functional basis of Nucleic acids.Understand the molecular basis of the metabolic pathway regulation.	3	2	2	2				3	3				3				
			CO5	Perform techniques used in biochemistry to address biochemical problems	3	2	2	2				3	3				3				

16	17BT2106	MICROBIOLOGY	CO1	Understand the functions and properties of bio molecules (carbohydrates, nucleic acids, proteins, lipids) in biological systems.	3	2		2				3	3					1		
			CO2	Understand the organization and biochemical reactions of bio molecules	3	2		2				3	3					1		
			CO3	Understand the importance of various metabolic pathways	3	2		2				3	3					1		
			CO4	Understand the importance of various biosignaling in biological systems	3	2		2				3	3					1		
			CO5	Perform techniques used in biochemistry to address biochemical problems	3	2		2				3	3					1		
17	17BT2102	Process Engineering Principles	CO1	Illustrate the various Basic Chemical Calculations and Solving Problems related to Units and Conversions	2	2												2		
			CO2	Outline the Basic Concepts of Ideal and real gas laws and solving Problems related to Ideal and real gas equations	2	2												2		
			CO3	Evaluate the quantification of various process using Material balance	2	2												2		
			CO4	Evaluate the quantification of various process using Energy balance	2	2												2		
18	17MT2011	Biostatistics	CO1	Interpret numerical data through various graphs and determination of various constants of the data	2				2											
			CO2	Measure and estimate the degree of linear relationship between two variables	2				2											
			CO3	Identify the suitable probability distribution to the given experimental data and calculation of various characteristics of the respective probability distributions	2				2											
			CO4	Draw the statistical inference of the given data through various tests of statistical hypothesis, viz., tests for means (single and two), analysis of variance	2				2											
19	17TS1001	Biotechnology Skilling - 1 (Medical Coding)	CO1	Apply reference manager in CPT						3	3									3
			CO2	Analyze ICD codes						3	3									3
			CO3	Develop diagnostic tests for clinical research						3	3									3
			CO4	Analyze applications of biostatistics in clinical trial management						3	3									3
			CO5	Analyze the data through learned methods						3	3									3
20	17CS2004	Object Oriented Programming	CO1	The student will be able to understand basic Concepts of OOP, fundamentals of java and apply the concepts of classes and objects through Java Language.	2	2		2												
			CO2	The student will be able to apply constructors, Overloading, parameter passing, in Java programming.	2	2		2												
			CO3	The student will be able to apply access control, Inheritance, Packages.	2	2		2												
			CO4	The student will be able to apply, Interfaces, Exception Handling	2	2		2												
			CO5	Students will be able to apply object-oriented programming concepts to write programs.	2	2		2												
21	17BT2107	Bioanalytical Techniques	CO1	Understand the basic principles of different bio analytical methods	3	3		3				3	3					3		
			CO2	Knowledge about techniques related to electrophoresis & spectroscopy	3	3		3				3	3					3		
			CO3	An understanding of use of Radioisotopes in biological sciences and its ethical issues	3	3		3				3	3					3		
			CO4	An ability to perform centrifugation, chromatography, electrophoresis & spectroscopy techniques	3	3		3				3	3					3		
			CO5	Analyze the methods for assay of bio molecules	3	3		3				3	3					3		
22	17BT2108	Molecular Biology	CO1	Understand the genome organization & replication		2				2	1									2
			CO2	Compare DNA transcription and translation mechanisms		1				2	1									2
			CO3	Understand the gene regulation mechanisms		1				2	1									2
			CO4	Apply the gene expression in bacteria		1				2	1									2
23	17BT2109	Immunology	CO1	Understand the various defense mechanism of body system	2			3	3	2	2		2	2		2	2	2		
			CO2	Compare different types of Ag-Ab reactions	2			3	3	2	2		2	2		2	2	2		
			CO3	Differentiate the role of B and T cells	2			3	3	2	2		2	2		2	2	2		
			CO4	Development of ELISA method for Ag-Ab reactions	2			3	3	2	2		2	2		2	2	2		
			CO5	Apply the various techniques for the vaccine production	2			3	3	2	2		2	2		2	2	2		
24	17ES2103	Biochemical Thermodynamics	CO1	Acquire the knowledge of terminology and zeroth, first laws of thermodynamics.	3	2	2											2		
			CO2	Determine entropy changes and apply second law of thermodynamics.	3	2	2											2		
			CO3	Compute thermodynamic properties for fluids.	3	2	2											2		

24			CO4	Apply chemical engineering thermodynamics to phase and reaction equilibria and design thermodynamic models for microbial growth.	3	2	2										2		
25	17TS1002	Biotechnology Skilling - 2 (Instrumentation)	CO1	Analyze spectroscopy in study of biomolecules					3	3			3	3			2	2			
			CO2	Analyze microscopy in study of biomolecules					3	3			3	3			2	2			
			CO3	Analyze chromatography in study of biomolecules					3	3			3	3			2	2			
			CO4	Analyze electrophoresis in study of biomolecules					3	3			3	3			2	2			
			CO5	Applying the concepts in lab					3	3			3	3			2	2			
26	17UC2204	Aptitude Builder - 1	CO1	Apply the concept of Critical Reading and Analytical Reading and comprehend the key ideas and gist of a passage. Understand the importance of the presentation skills, analyze the given topic, apply various strategies and the principles of grammar in written expression.									3	3							
			CO2	Apply the concepts of grammar, various strategies and the usage of formal language in written expression. By using synonyms rewrite the same text in the same format and meaning. Write the gist of the given text.									3	3							
			CO3	Apply the concepts of Numbers to solve the problems related to divisibility rules, problems based on Unit's digit, Remainders, Successive Division, Prime Factorization, LCM & HCF problems. Apply the concepts of Averages &Alligations, students will be able to solve the problems related to Averages as well as problems based on Mixtures.									3	3							
			CO4	Apply the various concepts of cubes to find out how to cut a cube to get the maximum number of smaller identical pieces, how to minimize the number of cuts required to cut a cube into the given number of smaller identical pieces, how to count the number of smaller cubes which satisfy the given painting scheme. Apply the principles of binary logic to solve problems involving truth-tellers, liars and alternators. Analyze the given data to form an ordered arrangement from an unorganized raw data.									3	3							
			CO5	Ability to apply the concepts practically through hands-on experience.									3	3							
27	17UC0008	Indian Constitution	CO1	Must be aware of the way the Indian constitution is made and must be aware of the features of the Indian constitution						2											
			CO2	Must be aware of the Union Government works						2											
			CO3	Must be aware of the way the state government works						2											
			CO4	Must be aware of the Indian judicial system and the election commission						2											
28	17ES2102	Transport Process in Biological Systems	CO1	Understand and apply principles of momentum transfer in biological systems	2	2	2	2				3	3				2				
			CO2	Understand and apply principles of Heat Transfer in Biological systems	2	2	2	2				3	3				2				
			CO3	Understand and apply principles of Mass Transfer in Biological systems	2	2	2	2				3	3				2				
			CO4	Apply separation and purification unit operations in biological products	2	2	2	2				3	3				2				
			CO5	Apply unit operations of momentum, heat and mass transfer in bioprocessing.	2	2	2	2				3	3				2				
29	17BT3110	Bioinformatics	CO1	Acquire the theoretical basis of bioinformatics and understand the access and analyze the biological information from databases.	3	2	1	1	2				3		2		2				
			CO2	Manipulate the DNA/protein sequences using standalone pc programs and with the help of the worldwide web.	3	2	1	1	2				3		2		2				
			CO3	Apply multiple sequence alignment tools on gene and protein sequences to find homologs, construct and interpret the evolutionary trees.	3	2	1	1	2				3		2		2				
			CO4	Use genome informatics tools and model protein three-dimensional structure of proteins.	3	2	1	1	2				3		2		2				
			CO5	Choose the sequences from the databases and apply sequence alignment, tree construction tools to infer their relations.	3	2	1	1	2				3		2		2				
30	17BT3111	Genetic Engineering	CO1	Understand the process of gene cloning	3	3						3	3	3							
			CO2	Apply the role of vectors in cloning process	3	3						3	3	3							
			CO3	Analyze various types of PCR	3	3						3	3	3							
			CO4	Compare various gene technology methods	3	3						3	3	3							
			CO5	Analyze cloning methods using recombinant molecules	3	3						3	3	3							
31	17BT3112	Fermentation Technology	CO1	Acquire the knowledge of fermentation process basics	2	3	3		3			3	3	2			2	3			
			CO2	Understand the knowledge of medium optimization	2	3	3		3			3	3	2			2	3			
			CO3	Acquire the knowledge of medium sterilization.	2	3	3		3			3	3	2			2	3			
			CO4	Understand the principles of aeration and agitation	2	3	3		3			3	3	2			2	3			

			CO5	Demonstrate fermentation processes to produce value added proteins and other biological substances for human, animal therapeutic use, food production processing and bio fuels.	2	3	3		3			3	3	2			2	3				
32	17BT3113	Biochemical Reaction Engineering	CO1	Acquire the knowledge of reaction engineering basics and batch reaction system.	2	2		3					3	3			2						
			CO2	Understand different bioreactor systems to analyze microbial growth and product formation.	2	2		3					3	3			2						
			CO3	Compare various multiphase bioreactors	2	2		3					3	3			2						
			CO4	Analyze biochemical processes for various biochemical parameters on microbial growth.	2	2		3					3	3			2						
			CO5	Demonstrate processes to produce value added proteins and other biological substances for human, animal therapeutic use, food production processing and bio fuels.	2	2		3					3	3			2						
33	17TS1003	Biotechnology Skilling - 3 (Animal Cell Culture)	CO1	Ability to analyze the structure and function of a cell.					3	3			3	3			2	2					
			CO2	Apply various techniques to culture the primary cell lines					3	3			3	3			2	2					
			CO3	Apply various techniques to isolate and maintain the cell lines					3	3			3	3			2	2					
			CO4	Apply the basic cell culture characterization techniques to understand the cell viability, cell counting as well as providing basic methods for passaging, freezing and thawing					3	3			3	3			2	2					
			CO5	Apply the learned methods practically to gain the hands-on experience.					3	3			3	3			2	2					
34	17BT3150	Technical Proficiency and Training - 1 (Genomics)	CO1	Apply the role of biomolecules in metabolic process	2	2				2							2						
			CO2	Compare and contrast various microorganisms	2	2				2							2						
			CO3	Analyse analytical methods for biological samples	2	2				2							2						
			CO4	Develop a model for protein-ligand binding process	2	2				2							2						
35	17UC0007	Indian Heritage & Culture	CO1	Must be aware of the basic concepts of Indian culture and civilization						3													
			CO2	Must be aware of the History of Indian culture						3													
			CO3	Must be aware of the impact created by west on Indian social and religious reforms						3													
			CO4	Must be aware of the resultant social reforms						3													
36	17BT3201	Plant Biotechnology	CO1	Acquire the knowledge of plant tissue culture and understand the principles and methods of plant genetic transformation.	3	2						3	3	3			2	2					
			CO2	Apply concepts of genetic engineering and genome editing to molecular farming in plants	3	2						3	3	3			2	2					
			CO3	Acquire the comprehension of animal cell culture principle and application and scale up of animal cell culture	3	2						3	3	3			2	2					
			CO4	Apply the concepts of Transgenic Animals, Recombinant DNA Technology, and Tissue Engineering in Animal Biotechnology	3	2						3	3	3			2	2					
			CO5	Apply tissue culture and genetic transformation in plant and cell culture techniques in animal cells	3	2						3	3	3			2	2					
37	17UC3105	Aptitude Builder-2	CO1	Apply the concept of Critical Reading and Analytical Reading and comprehend the key ideas and gist of a passage. Understand the importance of the presentation skills, analyze the given topic, apply various strategies and the principles of grammar in written expression.									3	3									
			CO2	Apply the concepts of grammar, various strategies and the usage of formal language in written expression. By using synonyms rewrite the same text in the same format and meaning. Write the gist of the given text.									3	3									
			CO3	Apply the concepts of Numbers to solve the problems related to divisibility rules, problems based on Unit's digit, Remainders, Successive Division, Prime Factorization, LCM & HCF problems. Apply the concepts of Averages &Alligations, students will be able to solve the problems related to Averages as well as problems based on Mixtures.									3	3									
			CO4	Apply the various concepts of cubes to find out how to cut a cube to get the maximum number of smaller identical pieces, how to minimize the number of cuts required to cut a cube into the given number of smaller identical pieces, how to count the number of smaller cubes which satisfy the given painting scheme. Apply the principles of binary logic to solve problems involving truth-tellers, liars and alternators. Analyze the given data to form an ordered arrangement from an unorganized raw data.									3	3									
			CO5	Ability to apply the concepts practically through hands-on experience.									3	3									
38	17TS1005	Biotechnology Skilling - 4 (Advanced Instrumentation)	CO1	Ability to understand the functional modules of an instrument.					3	3			3	3			2	2					
			CO2	Ability to understand the important components of a biological component.					3	3			3	3			2	2					
			CO3	Ability to learn the smallest function of every component.					3	3			3	3			2	2					
			CO4	Ability to join several components together for getting the desired function.					3	3			3	3			2	2					
			CO5	Ability to apply the learned methods with hands-on experience.					3	3			3	3			2	2					

39	17BT3202	Downstream processing	CO1	Acquire the knowledge of primary separation and recovery processes	2	2	2	2				2	2	2			3	
			CO2	Apply the principles of solid removal unit operations and product enrichment operations	2	2	2	2				2	2	2			3	
			CO3	Apply the principles of aqueous two-phase extraction process and product purification methods	2	2	2	2				2	2	2			3	
			CO4	Analyze the methods of alternative separation, product polishing and formulations	2	2	2	2				2	2	2			3	
			CO5	Evaluate the bioseparation methods for recovery, isolation and purification of various bioproducts	2	2	2	2				2	2	2			3	
40	17TS1006	Technical Proficiency and Training - 2 (Bioprocessing)	CO1	Apply the cloning methods for construction of recombinants	2	2				2							2	
			CO2	Compare and contrast among various PCR methods	2	2				2							2	
			CO3	Design, develop and optimize processes for purification of products	2	2				2							2	
			CO4	Application of appropriate technique/unit operation for the process and evolve processes for purification of products with high market value.	2	2				2							2	
41	17BT3256	Pharmaceutical Biotechnology	CO1	Acquire the knowledge of Fundamentals of pharmaceutical Practice	3	3	2	2	3								3	
			CO2	Asses the drug metabolism and pharmacokinetics and formulate pharmaceutical dosage & blood, plasma products	3	3	2	2	3								3	
			CO3	Compare various Pharmaceutical products	3	3	2	2	3								3	
			CO4	Develop various strategies of manufacturing processes	3	3	2	2	3								3	
42	17BT4155	Enzyme Engineering	CO1	Acquire the knowledge of terminology and classification of enzymes.	2	2	2										2	
			CO2	Understand the mechanisms of enzyme catalysis and action.	2	2	2										2	
			CO3	Evaluate the kinetics of enzyme parameters.	2	2	2										2	
			CO4	Understand the various industrial enzymes and their applications.	2	2	2										2	
43	17BT4157	Food Technology	CO1	Acquire the knowledge of food associated microbes	2	2	2										2	
			CO2	Describe food processing	2	2	2										2	
			CO3	Develop various strategies involved in preservation and storage	2	2	2										2	
			CO4	Conclude various principles involved in food microbiology	2	2	2										2	
44	17BT3261	Molecular Modelling and Drug Design	CO1	Acquire the knowledge of Introduction to Molecular Modeling	2	2			2								1	
			CO2	Describe the Basic concepts of Protein Modeling and Protein structure Determination	2	2			2								1	
			CO3	Develop Molecular Dynamics and Simulations	2	2			2								1	
			CO4	Design and construct Molecular modeling strategies in Drug Designing	2	2			2								1	
45	17BT4161	Python and R Programming	CO1	Understand the basics of Python and R programming	3	2			3								1	
			CO2	Analyze Biological sequence analysis with python	3	2			3								1	
			CO3	Analyze biological data statistics	3	2			3								1	
			CO4	Analyze gene expression with R	3	2			3								1	
46	17BT4162	Data Base Management System	CO1	Acquire knowledge on database systems	2	2			2								1	
			CO2	Apply SQL in relational model	2	2			2								1	
			CO3	Compare data storage devices	2	2			2								1	
			CO4	Analyze current trends in data types	2	2			2								1	
47	17BT3265	Cancer Biology	CO1	Acquire the knowledge of cancer	2		2		3		2		2				2	
			CO2	Understand about various agents in carcinogenesis	2		2		3		2		2				2	
			CO3	Apply molecular biology in various cancer cells	2		2		3		2		2				2	
			CO4	Apply the role of immune cells in Cancer	2		2		3		2		2				2	
48	17BT3266	Neurobiology	CO1	Understand the basic concepts of neuroscience	2				2				2				2	
			CO2	Understand Neurotransmitters and Receptors	2				2				2				2	
			CO3	Compare and contrast vestibular system	2				2				2				2	
			CO4	Develop various strategies of nervous system andits Neuronal modulation	2				2				2				2	

49	17BT4164	Tissue Engineering	CO1	Remember the knowledge of Tissue Engineering and Cell-Based Therapies	2		2			3		2		2				2
			CO2	Recall the knowledge of Tissue culture basics	2		2			3		2		2				2
			CO3	Understand 3D organization and angiogenesis	2		2			3		2		2				2
			CO4	Apply the role of Stem Cells in treating tissue defects using case studies	2		2			3		2		2				2
50	17BT3255	Microbial Technology	CO1	Acquire the knowledge of microbial technology	2	2	2										2	
			CO2	Screen out medium and strain development	2	2	2										2	
			CO3	Develop various strategies to produce Primary and secondary Metabolites	2	2	2										2	
			CO4	Design various strategies to produce Enzymes, recombinant Proteins, and other special bio products.	2	2	2										2	
51	17BT4154	Bioprocess Economics and Plant Design	CO1	Understand basics of economic evaluation	2	2	2										2	
			CO2	Acquire the knowledge of Bioprocess Economics	2	2	2										2	
			CO3	Develop various strategies of process design	2	2	2										2	
			CO4	Design various strategies of Basic considerations in equipment design and Basic Design Problems	2	2	2										2	
52	17BT4160	Applied Bioinformatics	CO1	Acquire the knowledge of genomics	2	2			2								1	
			CO2	Describe the Protein dynamics	2	2			2								1	
			CO3	Compare various techniques for applied bioinformatics	2	2			2								1	
			CO4	Conclude the applications of system biology	2	2			2								1	
53	17BT3262	Structural Biology	CO1	Acquire the knowledge of Structural biology of Nucleic Acids	2	2			2								1	
			CO2	Describe the Protein dynamics	2	2			2								1	
			CO3	Compare various techniques for structural biology	2	2			2								1	
			CO4	Conclude the principles involved in structure predictions and structural elucidation	2	2			2								1	
54	17BT3263	Stem cell technology	CO1	Acquire the knowledge of stem cell technology	2		2				2		2					2
			CO2	Understand stem cell characterization and tissue engineering	2		2				2		2					2
			CO3	Illustrate various strategies involved in regulation and stem cell.	2		2				2		2					2
			CO4	Apply various principles involved in stem cell therapies.	2		2				2		2					2
55	17BT3264	Healthcare Biotechnology	CO1	Acquire the knowledge of simple proteins and therapeutic agents	3				3								2	
			CO2	Acquire the knowledge of Human diseases	3				3								2	
			CO3	Describe the various vaccines used	3				3								2	
			CO4	Understand the applications of genetic engineering in healthcare	3				3								2	
56	17IE3247	Term Paper	CO5	An illustration of logic, and in organizing the information of the topic, gathering the data, processing, analyzing and summarizing.					2		3	3	3	3			2	2
57	17IE4048	PROJECT (Part- 1)	CO5	Analyze the constructed data to derive the biologically useful results, as per the problem.					2		3	3	3	3			2	2