

**Statements of Course Outcomes (COs) and Mapping with Program Outcomes (POs) and Program Specific Outcomes (PSOs) : Dept. of Biotechnology : 2019-23**  
**(Batch passed-out in 2023; 2019-23) BKL # K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create**

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1	KAS101	-	CO-1	Understand the concept of theory of relativity and their related concepts.	K2	3.0	2.0										3.0					
			CO-2	To solve the engineering problems based on Electromagnetic Field Theory.	K3	3.0	3.0	2.0											3.0			
			CO-3	To solve the limiting problems of Classical Physics using concepts of Quantum Mechanics.	K3	3.0	2.0													3.0		
			CO-4	Understand the concept of wave nature related phenomenon and resolving power of an optical instrument.	K2	3.0	3.0													3.0		
			CO-5	Understand basic concept of LASER and fiber optics.	K2	3.0	3.0	3.0												3.0		
			<b>KAS101</b>						3.0	2.6	2.5										3.0	
2	KBT102	-	CO-1	To understand the basics of living systems.	K2						2.0	2.0	2.0					3.0				
			CO-2	To understand key common features of living organisms & its function.	K2							2.0		2.0						3.0		
			CO-3	To know the basic concepts of anatomy and functions of cells	K3							2.0								3.0		
			CO-4	To understand the concept of the alleles and genes.	K2							2.0	2.0							3.0		
			CO-5	Analyze the basics of plant physiology.	K5							2.0	2.0	2.0						2.0		
			<b>KBT102</b>										2.0	2.0	2.0					2.8		
3	KBT101	-	CO-1	Apply the system of Linear inequities and Quadratic Equations.	K3	2.0	2.0	2.0										2.0				
			CO-2	Apply the concept of Arithmetic and Geometric Progressions for finding the nth term and sum of series.	K3	2.0	2.0	2.0											2.0			
			CO-3	Apply the concept of Conic sections to find distance of a point.	K3	2.0	2.0	2.0											2.0			
			CO-4	Apply the concept of limit, continuity and differentiability.	K3	2.0	2.0	2.0											2.0			
			CO-5	Apply for finding the derivatives of different type of functions and maxima, minima.	K3	3.0	3.0	2.0	2.0											2.0		
			<b>KBT101</b>					2.2	2.2	2.0	2.0									2.0		



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8	KAS202	=	CO-1	Understanding atomic and molecular structure from nanoscale to macromolecules.	K2	3.0											2.0					
			CO-2	Apply the concept of spectroscopy for compound identification and structural analysis.	K3	3.0	2.0															
			CO-3	Apply the concepts of electrochemistry to corrosion, batteries and phase rule .	K3	3.0	2.0													2.0		
			CO-4	Analyse the water sample and coal samples for their hardness and calorific values respectively.	K3	3.0	2.0					2.0	2.0							2.0		
			CO-5	Attain the chemical knowledge on the concept of polymers and polymerization.	K2	3.0						2.0	2.0							2.0		
			<b>KAS202</b>					3.0	2.0				2.0	2.0						2.0		
9	KBT202	=	CO-1	To know the basic idea of Microbiology.	K2						2.0	2.0	2.0					3.0				
			CO-2	To Understand the functional anatomy of cells.	K2							2.0		2.0					3.0			
			CO-3	To know the energy production mechanism.	K2							2.0							3.0			
			CO-4	To understand the energy utilization.	K2							2.0	2.0						3.0			
			CO-5	Reproductive health and human welfare.	K5							2.0	2.0	2.0					2.0			
			<b>KBT202</b>										2.0	2.0	2.0					2.8		
10	KBT201	=	CO-1	Apply the basic concepts of Integration to find area between the curves.	K3	3.0	3.0	2.0										2.0				
			CO-2	Apply the concept of differentiation for finding the solution of Differential equations.	K3	2.0	2.0	2.0	2.0										2.0			
			CO-3	Apply with the concept of vector for finding direction cosines,Projection of a vector.	K3	2.0	2.0	2.0											2.0			
			CO-4	Apply the concept of three dimensional geometry in engineering.	K3	2.0	2.0	2.0	2.0										2.0			
			CO-5	Apply the concept of Probability in Comprehensive Manner.	K3	3.0	3.0	3.0	2.0										2.0			
			<b>KBT201</b>					2.4	2.4	2.2	2.0									2.0		
11	KCS201	=	CO-1	Translate the algorithms to programs & perform its execution in C language.	K3	3.0												3.0				
			CO-2	Implement conditional branching, instructions along with operators.	K3	3.0	3.0	3.0											3.0			
			CO-3	Use looping control instructions to decompose a problem into function.	K3	3.0	3.0	3.0											3.0			
			CO-4	Apply arrays and structures to develop programs.	K3	3.0	3.0	3.0											3.0			
			CO-5	Utilize pointer, file handling, dynamic memory allocation to solve problems.	K3	3.0	3.0	3.0											3.0			
			<b>KCS201</b>					3.0	3.0	3.0										3.0		

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12	KAS204	=	CO-1	Be acquainted with specific dimensions of communication skills.	K2	2.0		3.0						2.0	2.0								
			CO-2	Create substantial base by the formation of strong professional vocabulary.	K3	2.0													2.0				
			CO-3	Apply communication skills at their work place for writing purposes.	K3		2.0	3.0															
			CO-4	Cultivate relevant technical style of communication & presentation.	K3				2.0														
			CO-5	Apply techniques for developing interpersonal communication skills and positive attitude.	K3		2.0	3.0	2.0							3.0	3.0	3.0					
			<b>KAS204</b>						2.0	2.0	3.0	2.0					2.5	2.5	3.0	2.0			
13	KAS252	=	CO-1	Perform experiments with different analytical instruments for chemical properties.	K3	2.0					2.0	2.0		2.0			2.0						
			CO-2	Compare molecular / system properties such as surface tension, viscosity with water.	K3	2.0																	
			CO-3	Measure alkalinity, hardness and chloride content of water.	K2	3.0	2.0						2.0	2.0		2.0				2.0			
			CO-4	Determine the iron content and available chlorine in given sample.	K3	2.0								2.0									
			CO-5	Know the fundamental concepts of the preparation of phenol formaldehyde & urea formaldehyde resin.	K2	2.0	2.0						2.0	2.0							2.0		
			<b>KAS252</b>						2.2	2.0				2.0	2.0		2.0			2.0			
14	KCS251	=	CO-1	Solve simple problems based on arithmetic expressions using operators.	K3	2.0	2.0	2.0															
			CO-2	Implement conditional branching instructions to develop programs.	K3	3.0	3.0	3.0															
			CO-3	Use looping control instructions and functions to solve complex problems.	K3	3.0	3.0	3.0													3.0		
			CO-4	Design solutions by using arrays and structures to develop programs.	K3	3.0	3.0	3.0														3.0	
			CO-5	Utilize pointer, file handling, dynamic memory allocation to solve problems.	K3	3.0	3.0	3.0														3.0	
			<b>KCS251P</b>						2.8	2.8	2.8											3.0	
15	WS201	=	CO-1	Use various engineering materials, tools, machines and measuring equipments.	K3	2.0					2.0		2.0	2.0				2.0					
			CO-2	Perform machine operations in lathe and CNC machine.	K3	3.0					2.0	2.0		2.0	3.0				2.0				
			CO-3	Perform manufacturing operations on components in fitting and carpentry shop.	K3	2.0						2.0		2.0	2.0				2.0				

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	K		CO-4	Perform operations in welding, moulding and casting .	K3	3.0					2.0	2.0	2.0	2.0			2.0			
			CO-5	Fabricate a job by 3D printing manufacturing technique.	K3	2.0				2.0	2.0	2.0	3.0				2.0			
			<b>KWS201</b>				2.4				2.0	2.0	2.0	2.4				2.0		

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16	KAS 304	III	CO-1	Understand the concept of Fourier Transform and Z-Transform to apply for solving with the help of transform problems.	K2,K3	3.0	2.0	3.0										3.0	3.0		
			CO-2	Remember the concept of probability to evaluate Probability Distribution.	K1,K3	3.0	3.0	2.0											3.0	3.0	
			CO-3	Apply the concept of numerical techniques to evaluate the zero's of the function interpolation.	K4,K5	3.0	3.0													3.0	3.0
			CO-4	Apply the concept of hypothesis to evaluate various hypothesis testings.	K3,K5	3.0														3.0	3.0
			CO-5	Remember the concept of design and statistical quality control to create control chart.	K1,K6	3.0														3.0	3.0
				<b>KAS304</b>		3.0	2.7	2.5										3.0	3.0		
17	KAS 301	III	CO-1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.	K3	2.0			2.0						2.0				3.0		
			CO-2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K2	2.0	2.0	2.0												2.0	
			CO-3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K2				2.0	2.0						3.0	2.0				3.0
			CO-4	Technical Communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K3				2.0	2.0							2.0	2.0			3.0
			CO-5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K1										2.0	3.0					3.0
				<b>KAS301</b>		2.0	2.0	2.0	2.0	2.0				2.0	2.7	2.0	2.0		2.8		
18	KBT 301	III	CO-1	Acquire knowledge on types of microscope and its applications in Biotechnology.	K2	3.0	2.0		2.0	2.0							2.0	3.0	2.0		
			CO-2	Learn working principle of chromatographic techniques for qualitative and quantitative analysis of biomolecules.	K3	2.0	2.0		2.0	2.0								2.0	2.0	2.0	
			CO-3	Employ various spectroscopic techniques for qualitative and quantitative analysis of Bio-Molecules/Bio-Analytes.	K3	3.0	2.0		2.0									3.0	2.0	2.0	
			CO-4	Employ various electrophoresis and centrifugation techniques for analysis of Bio-Molecules/Bio-Analytes.	K3	2.0	2.0		2.0	2.0									2.0	2.0	
			CO-5	Acquire knowledge on 3 D printing and bioprinting as well as biosensors.	K2	3.0	2.0	3.0	2.0			2.0							3.0	2.0	2.0
				<b>KBT 301</b>		2.6	2.0	3.0	2.0	2.0	2.0						2.5	2.2	2.0		

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19	KBT 302	III	CO-1	Apply the basic principles of microbial techniques for the culturing, identification of bacteria and growth measurement.	K2	2.0	2.0		2.0							2.0	2.0	2.0	2.0		
			CO-2	Discern the strategies of bacterial processes and virus replication.	K2	2.0		2.0											2.0	2.0	2.0
			CO-3	Illustrate the cellular and molecular components of immune system.	K2	2.0			2.0									2.0	3.0	3.0	3.0
			CO-4	Illustrate the processes of immune system and principles of immunotechniques.	K2				2.0									2.0	2.0	3.0	3.0
			CO-5	Apply microorganisms for bioremediation and immunotechniques for disease diagnosis.	K2		3.0	2.0													3.0
				<b>KBT302</b>		2.0	2.5	2.0	2.0							2.0	2.3	2.6	2.6		

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20	KBT 303	III	CO-1	To understand unique property of water as a universal solvent and its importance in biochemistry.	K2	3.0	2.0	3.0	2.0			3.0					2.0	3.0	2.0			
			CO-2	Able to understand the structure and properties of Carbohydrates and their metabolic events.	K3	2.0		3.0	3.0									3.0	2.0	3.0		
			CO-3	To understand the importance of lipids as energy currency, storage molecules and their classification.	K2	3.0		2.0	3.0										3.0	3.0	3.0	
			CO-4	Able to describe the classification and structural organization of proteins/amino acids.	K3	3.0	3.0	3.0											3.0	3.0	2.0	
			CO-5	Describe the structure and properties of nucleic acids and ability to relate various interrelated metabolic events	K3		3.0													3.0	3.0	3.0
			<b>KBT303</b>						2.8	2.7	2.8	2.7			3.0					2.8	2.8	2.6
21	KBT 351	III	CO-1	To understand concept of precision,accuracy for principle and working of laboratory microscop.	K2		3.0		3.0	3.0			3.0	3.0		3.0	3.0	3.0	3.0			
			CO-2	To learn and apply the spectrophotometric techniques for identification or quantification of biomolecules.	K2				3.0	3.0	3.0									3.0		
			CO-3	Understand the principle and execute the different chromatographic techniques for separation of biomolecules.	K3	3.0	3.0	3.0	3.0	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
			CO-4	To apply the electrophoresis for quantitative and qualitative analysis of biomolecules	K3	3.0	3.0	3.0	3.0	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
			CO-5	To learn and execute the extraction and separation of biomolecules.	K2	3.0			3.0	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
			<b>KBT351</b>						3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0
22	KBT 352	III	CO-1	Prepare the different culture medium and inoculate the microorganisms into it.	K2		3.0	3.0		3.0				3.0			3.0	3.0	3.0			
			CO-2	Culture microorganisms using various techniques and perform different staining procedures to identify the microorganisms.	K2			3.0		3.0					3.0				3.0	3.0	3.0	
			CO-3	Isolate and enumerate the micro-organisms .	K2			3.0	3.0										3.0	3.0	3.0	
			CO-4	Perform and apply different types of immunodiffusion techniques.	K2		3.0	3.0	3.0										3.0	3.0	3.0	
			CO-5	Perform and apply different types of ELISA techniques.	K2	3.0		3.0		3.0						3.0			3.0	3.0	3.0	
			<b>KBT352</b>						3.0	3.0	3.0	3.0	3.0			3.0			3.0	3.0	3.0	3.0
			CO-1	Understand the basic concepts behind the preparation of different types of solutions and their role in biochemistry.	K2	3.0	3.0	3.0	3.0			3.0					3.0	3.0	3.0			



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23	KBT 353	III	CO-2	Understand the roles of foodstuffs are turned into metabolic energy and predict energy content of different types of macromolecules espically Carbohydrates.	K3	3.0	3.0	3.0	3.0								3.0	3.0	3.0		
			CO-3	Able to differentiate different macromolecules and their structural organization and along with their importance.	K3	3.0	3.0	3.0						3.0				3.0	3.0	3.0	
			CO-4	Able to understand the basic composition of nucleic acids and fatty acids their roles in biological system.	K2	3.0								3.0	3.0					3.0	3.0
			CO-5	Able to understand the role of different techniques for purification of macromolecules.	K4	3.0	3.0	3.0					3.0	3.0					3.0	3.0	3.0
			<b>KBT353</b>					3.0	3.0	3.0	3.0			3.0	3.0	3.0				3.0	3.0

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24	KNC 301	III	CO-1	Understand the software bugs that pose cybersecurity threats and how to fix the bugs to mitigate such threats.	K2	3.0	3.0	3.0	2.0	3.0	3.0		2.0	1.0	3.0	2.0	3.0		1.0		
			CO-2	Understand the attack scenarios to web browsers, web servers and how to mitigate such threats.	K2	3.0	3.0	3.0	3.0	3.0	3.0		3.0	2.0	3.0	2.0	3.0			2.0	
			CO-3	Understand the cyber security holes in standard networking protocols such as TCP/IP, ARP, DNS, Ethernet, BGP etc and how to mitigate such Security hole.	K2, K4	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	2.0	3.0			3.0	
			CO-4	Understand the difference between System Security, Network Security and Cryptography, Crypto- Protocol etc.	K2, K5	3.0	1.0		1.0	3.0	3.0		3.0	3.0	3.0	1.0	3.0	1.0	3.0	1.0	3.0
			CO-5	Analyze the cyber threats to Critical Infrastructures.	K4	3.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	3.0	1.0	3.0	1.0	3.0	1.0	3.0
			<b>KNC301</b>			3.0	2.6	3.0	2.4	2.8	3.0		2.8	2.4	3.0	1.6	3.0	1.0	2.4		
25	KBT 354	III	CO-1	Understand the basic concepts of solution preparation and basic principle of different instruments.	K2	3.0	3.0	2.0			1.0		3.0	3.0			1.0	3.0	2.0		
			CO-2	Prepare the solutions and handle the instruments like centrifuge, spectrophotometer, pH meter etc.	K3	3.0	3.0	2.0			2.0		3.0	3.0		1.0	2.0	3.0	2.0		
			CO-3	Perform the analytical experiments.	K3	3.0	3.0	3.0	2.0	2.0	3.0		3.0	3.0		1.0	3.0	3.0	2.0		
			CO-4	Distinguish different types of microscopes and its applications.	K5	3.0	3.0	3.0	2.0	3.0	3.0		3.0	3.0	2.0	1.0	3.0	3.0	2.0		
			CO-5	Perform microscopic experiments.	K4	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	2.0	1.0	3.0	3.0	3.0		
			<b>KBT354</b>			3.0	3.0	2.6	2.3	2.7	2.4		3.0	3.0	2.0	1.0	2.4	3.0	2.2		
26	KOE 043	IV	CO-1	Understand the basic of concept of different types of energies, energy conversion and energy storage.	K2	3.0	3.0	2.0					3.0	3.0				3.0	2.0		
			CO-2	Express the basic of concept of Nuclear Energy.	K2	3.0	3.0	2.0			2.0		3.0	3.0				2.0	3.0	3.0	
			CO-3	Express the basic concept about Solar energy.	K2	3.0	3.0	3.0	2.0	2.0	3.0		3.0	3.0				3.0	3.0	3.0	
			CO-4	Compare the concept of conventional and non-conventional energy sources.	K2	3.0	3.0	3.0	2.0	3.0	3.0		3.0	3.0	2.0			3.0	3.0	2.0	
			CO-5	Understand about the world and India energy scenario and energy audit.	K2	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	2.0			3.0	3.0	3.0	
			<b>KOE043</b>			3.0	3.0	2.6	2.3	2.7	2.8		3.0	3.0	2.0		2.8	3.0	2.6		

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S. No.	Sub Code	Sem	COx	Statement of Course Outcomes (COs)	Kx	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2		
				<b>Statement of Course Outcomes (COs)</b> <b>Upon completion of topic concerned, students will be able to :</b>	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Core and allied skill	Interdisciplinary skills		
27	KVE 401	IV	CO-1	Get clarity and illustrate about the need, basic guidelines, content, and process of value education; get the clarity of basic human aspirations and the program of its fulfillment and do a critical appraisal of current scenario in society regarding happiness and prosperity.	K2, K4						2.0	3.0	3.0	3.0					2.0		
			CO-2	Get clarity about human being as co-existence of self and body ; apply the clarity of the content of value education to initiate a process of dialog within themselves so as to know what they 'really want to be' in their life and profession, and also to ensure harmony at all the four levels of living and lead an ethical life.	2, K3, K4							2.0	2.0	3.0	2.0					2.0	
			CO-3	Get clarity of values necessary for harmonious relationship, undivided human society and universal human order; analyze about feelings in relationship in family, society and relevance of nature.	K2, K4							2.0	2.0						2.0		2.0
			CO-4	Get clarity of provision of harmony in nature and existence; workout and evaluate their mutual fulfilling participation at all the four levels of living.	2, K3, K5									2.0	3.0	2.0			2.0		2.0
			CO-5	Get clarity of ethical and unethical practices in profession; develop their emotional, social and professional competence and start working out the strategy to actualize a harmonious environment wherever they work.	2, K3, K6							2.0	2.0	2.0	2.0						2.0
			<b>KVE 401</b>							2.0	2.2	2.8	2.3				2.0		2.0		
28	KBT 401	IV	CO-1	Familiarize with the properties of fluids and the applications of fluid mechanics in a bioreactor.	K2	3.0	3.0	3.0	3.0								3.0	3.0	3.0		
			CO-2	Understand the concept of fluid flow measurement, types of flows and dimensional analysis.	K3	3.0	3.0											3.0			
			CO-3	Understand the basic concept of heat transfer modes viz. conduction, convection and radiation.	K2	3.0		3.0											3.0		
			CO-4	Understand the basic mechanism of mass transfer including diffusion and convective mass transfer.	K3	3.0	3.0												3.0		
			CO-5	Understand the mass transfer in fluidized beds and gas-liquid interface in biomedical applications.	K3	3.0		3.0	3.0			3.0						3.0		3.0	3.0
			<b>KBT401</b>			3.0	3.0	3.0	3.0		3.0					3.0	3.0	3.0	3.0		
			CO-1	Understand the inheritance of genetic traits across generation under the different inheritance pattern.	K2	3.0	3.0		3.0									3.0	3.0		

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29	KBT 402	IV	CO-2	Understand genome organization, mutations and various types of DNA sequences.	K2	3.0	3.0	3.0										3.0	3.0			
			CO-3	Understand the molecular processes of central dogma of molecular biology and the basic concept of gene cloning.	K3	3.0		3.0	3.0										3.0		3.0	
			CO-4	Understand the concepts of Linkage and recombination, crossing over and genetic mapping.	K3	3.0		3.0			3.0									3.0	3.0	3.0
			CO-5	Apply the properties of genetic code for protein synthesis.	K2	3.0	3.0	3.0												3.0	3.0	3.0
			<b>KBT402</b>			3.0	3.0	3.0	3.0	3.0								3.0	3.0	3.0		

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30	KBT 403	IV	CO-1	On completion of this course, the students will be able to understand the basic concepts, composition and role of enzyme in biochemical process.	K2	3.0			3.0			3.0				3.0		3.0	3.0				
			CO-2	On completion of this course, the students will be able to understand the roles of different physical factors in the stability of enzyme during reaction catalyzed.	K2	3.0		3.0	3.0											3.0	3.0		
			CO-3	On completion of this course, the students will be able to extract the crude enzyme from various sources.	K3	3.0		3.0	3.0												3.0	3.0	
			CO-4	On completion of this course, the students will be able to differentiate between enzyme immobilization methods and their application in different fields.	K4	3.0	3.0	3.0					3.0							3.0	3.0	3.0	
			CO-5	On completion of this course, the students will be able to investigate the designing of different enzyme electrodes and their use in industry.	K5		3.0													3.0	3.0	3.0	
			<b>KBT403</b>						3.0	3.0	3.0	3.0			3.0				3.0	3.0	3.0	3.0	
31	KBT 451	IV	CO-1	Understand the basic principle of Bernoulli theorem in fluid flow measuring devices like venturi and orifice meter.	K2	3.0	3.0		3.0									3.0	3.0	3.0			
			CO-2	Ability to understand the classification of fluid flow like laminar, transition and turbulent flows.	K2	3.0														3.0	3.0	3.0	
			CO-3	Ability to understand the mechanism of steady state heat conduction of different materials for plane, cylindrical and spherical geometries.	K2	3.0	3.0	3.0													3.0	3.0	3.0
			CO-4	Understand the application of radiation to determine the surface emissivity of a test plane surfaces.	K3	3.0	3.0	3.0													3.0		3.0
			CO-5	Ability to analyze the experimental data and validation with theoretical empirical correlations.	K4	3.0	3.0	3.0	3.0										3.0		3.0	3.0	
			<b>KBT451</b>						3.0	3.0	3.0	3.0							3.0	3.0	3.0	3.0	
32	KBT 452	IV	CO-1	Perform the isolation of DNA from different cells.	K2		3.0		3.0	3.0									3.0	3.0	3.0		
			CO-2	Perform Polyacrylamide gel electrophoresis and PCR amplification of DNA.	K3			3.0			3.0				3.0					3.0	3.0	3.0	
			CO-3	Estimate the DNA content and Tm of DNA.	K2			3.0	3.0												3.0	3.0	3.0
			CO-4	Isolate the polytene chromosome from Drosophila.	K1		3.0		3.0												3.0	3.0	3.0
			CO-5	Apply the concepts of inheritance for the genetic crosses and calculation of genetics and allelic frequencies.	K2	3.0					3.0					3.0					3.0	3.0	3.0
			<b>KBT452</b>						3.0	3.0	3.0	3.0	3.0				3.0				3.0	3.0	3.0
			CO-1	On completion of this course, the students will be able to understand the basic concepts behind the production and isolation of enzyme from different sources.	K2	3.0	3.0	3.0				3.0							3.0	3.0			

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33	KBT 453	IV	CO-2	On completion of this course, the students will be able to check the activity/purity of enzyme and its optimum parameters.	K3	3.0			3.0		3.0					3.0		3.0	3.0		
			CO-3	On completion of this course, the students will be able to recover or estimate the enzyme or protein from a solution.	K4	3.0		3.0	3.0	3.0		3.0						3.0	3.0	3.0	
			CO-4	On completion of this course, the students will be able to able to differentiate the different enzyme immobilization methods.	K4	3.0	3.0						3.0					3.0		3.0	3.0
			CO-5	On completion of this course, the students will be able to differentiate between enzyme and its inhibition.	K4		3.0		3.0										3.0	3.0	3.0
			<b>KBT 453</b>						3.0	3.0	3.0	3.0	3.0	3.0					3.0	3.0	3.0
34	KNC 402	IV	CO-1	To read and write simple Python programs.	K3	3.0		3.0										3.0			
			CO-2	To develop Python programs with conditionals and loops.	K2	3.0		3.0	3.0									3.0	3.0		
			CO-3	To define Python functions and to use Python data structures : lists, tuples, dictionaries.	K2	3.0		3.0				3.0							3.0		3.0
			CO-4	To do input/output with files in Python.	K3		3.0												3.0	3.0	
			CO-5	To do searching ,sorting and merging in Python.	K1	3.0		3.0	3.0			3.0							3.0	3.0	3.0
<b>KNC402</b>						3.0	3.0	3.0	3.0		3.0					3.0	3.0	3.0			

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				<p align="center"><b>Statement of Course Outcomes (COs)</b>  <b>Upon completion of topic concerned, students will be able to :</b></p>	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Core and allied skill	Interdisciplinary skills		
35	KNC 501	V	CO-1	On completion of this course, the students will be able to identify and explore the basic features and modalities about Indian constitution.	K1-K2						3.0		3.0						3.0		
			CO-2	On completion of this course, the students will be able to differentiate and relate the functioning of Indian parliamentary system at the center and state level.	K2							3.0		3.0	3.0	3.0		3.0		3.0	
			CO-3	On completion of this course, the student will be able to differentiate different aspects of Indian Legal System and its related bodies.	K3			3.0		3.0	3.0	3.0	3.0	3.0				3.0		3.0	
			CO-4	On completion of this course, the student will be able to discover and apply different laws and regulations related to engineering practices.	K4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
			CO-5	On completion of this course, the student will be able to correlate role of engineers with different organizations and governance models.	K5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
			<b>KNC501</b>						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	BT 501	V	CO-1	Students will be able to enlist an appropriate use of host and vector for gene cloning.	K2	2.0	3.0	3.0	1.0					1.0	1.0			3.0	2.0		
			CO-2	Students will be able to analyze the use of gene library for screening of desired gene sequence/protein.	K3	2.0	2.0	2.0	1.0				2.0	1.0	1.0			2.0	3.0	2.0	
			CO-3	Students will be able to analyze different types of PCR and DNA sequencing methods.	K2	2.0	3.0	2.0	2.0					2.0	1.0			2.0	3.0	2.0	

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	KB		CO-4	Students will be able to appraise the cloning process of whole organism and its application.	K1	2.0	1.0	3.0	2.0				3.0	2.0	3.0	2.0	3.0	3.0	2.0			
			CO-5	Students will be able to assess the cell signaling and ethical issues related to Gene transfer.	K2	2.0	1.0	1.0	1.0				3.0	2.0	3.0	2.0	2.0	3.0	2.0			
				<b>KBT501</b>			2.0	2.0	2.2	1.4				2.7	1.6	1.8	2.0	2.3	3.0	2.0		
37	KBT 502	V	CO-1	Students will be able to comprehend the concepts of fermentation technology and its industrial applications.	K2	3.0											3.0	3.0	2.0			
			CO-2	Students will be able to learn the concepts of inoculum development, types of fermentation and microbial measurement.	K3	3.0	3.0	3.0				2.0					3.0	3.0	3.0	3.0		
			CO-3	Students will be able to familiarize with the concepts of media preparation, regulatory mechanism of microbes, overproduction of metabolites.	K3	3.0	3.0	3.0											3.0	3.0	3.0	
			CO-4	Students will be able to evaluate the concepts of optimization, sterilization, microbial growth kinetics, death kinetics.	K3		3.0	3.0											2.0	2.0	3.0	
			CO-5	Students will be able to apply the process, parameters, materials for industrial production of metabolites, materials & energy balance concepts apply in solving the Industrial problems.	K3	2.0		2.0				3.0	3.0	3.0			3.0			3.0	3.0	
						<b>KBT502</b>			2.8	3.0	2.8		3.0	2.5	3.0		3.0		3.0	2.8	2.8	2.8
38	KBT 503	V	CO-1	Students will be able to understand concepts and application of Bioinformatics, types of databases, sequence similarity, sequence patterns and profiles.	K2	2.0	3.0		2.0						3.0				3.0	2.0		
			CO-2	Students will be able to use sequence alignment techniques, database searching, pairwise and multiple sequence alignment using various tools.	K2	2.0	2.0	3.0												2.0	2.0	
			CO-3	Students will be able to understand scoring matrices and its types including PAM , BLOSUM series and matrices for nucleic acid and protein sequences.	K2	2.0	2.0									2.0				2.0	2.0	
			CO-4	Students will be able to apply phylogeny and its concepts in molecular evolution and different methods of Phylogenetic tree construction.	K3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				3.0	2.0			3.0	2.0
			CO-5	Students will be able to understand and apply the protein structure prediction and application of bioinformatics in drug designing.	K1	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0				3.0	2.0		3.0	2.0	3.0
						<b>KBT503</b>			2.2	2.2	2.3	2.3	2.5	2.5			2.7	2.3		3.0	2.4	2.2



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39	KBT 052	V	CO-1	Illustrate the fundamental of nanoscience, nanotechnology and biomedical polymers.	K3	3.0	1.0	1.0		2.0						2.0		3.0	3.0			
			CO-2	Learn the synthesis of carbon nanotubes, metal/metal oxide nanoparticles.	K2	2.0	3.0	2.0	1.0	2.0		3.0							2.0	3.0	2.0	
			CO-3	Demonstrate working principle of advance tools and technique.	K2	1.0	2.0	2.0	2.0	2.0	2.0							2.0	2.0	3.0	3.0	
			CO-4	Distinguish different types of nanomaterial's biomedical polymers and uses in medical field.	K3	2.0	2.0	2.0	2.0				2.0	2.0						3.0	3.0	
			CO-5	Develop nanomaterial based solution for medical and diagnostic application in health care.	K1	2.0	1.0	2.0	2.0										2.0	3.0	3.0	
			<b>KBT052</b>						2.0	1.8	1.8	1.8	2.0		2.5	2.0			2.0	2.0	3.0	2.8
40	KBT 551	V	CO-1	Demonstrate the isolation of genetic materials and their estimation.	K2	3.0	3.0	3.0			3.0	3.0	3.0					3.0	3.0	3.0		
			CO-2	Perform experiments related to cloning, ligation, restriction and digestion.	K3	3.0	3.0	3.0				3.0	3.0	3.0					3.0	3.0	3.0	
			CO-3	Prepare competent cells for transformation.	K2	3.0	3.0	3.0				3.0	3.0	3.0					3.0	3.0	3.0	
			CO-4	Analyse the competent cell using blue white screening.	K2	3.0	3.0	3.0	3.0				3.0	3.0	3.0					3.0	3.0	3.0
			CO-5	Analyse the Southern Blotting for identification of desired DNA in a pool DNA samples.	K2	3.0		3.0	3.0				3.0	3.0	3.0		3.0			3.0	3.0	3.0
			<b>KBT551</b>						3.0	3.0	3.0	3.0		3.0	3.0	3.0				3.0	3.0	3.0
			CO-1	Demonstrate the growth pattern of <i>E.coli</i> .	K2	3.0					3.0			3.0				3.0	3.0	3.0		

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41	KBT 552	V	CO-2	Perform experiments related to production of antibiotics, enzymes and acids through fermentation process.	K2		3.0	3.0	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0			
			CO-3	Demonstrate the downstream processing of fermentative products.	K3	3.0		3.0						3.0		3.0			3.0	3.0		
			CO-4	Perform the solid state fermentation and submerged fermentation.	K3	3.0	3.0	3.0		3.0		3.0		3.0						3.0	3.0	
			CO-5	Perform the utilization of liquid waste in production of metabolites.	K3	3.0		3.0	3.0		3.0	3.0					3.0			3.0	3.0	
			<b>KBT552</b>					3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	3.0	
42	KBT 553	V	CO-1	Demonstrate the retrieval of sequence data.	K3	3.0						3.0			3.0			3.0	3.0			
			CO-2	Perform experiments related to locating chromosome and gene expression data.	K2	3.0	3.0	3.0		3.0	3.0								3.0	3.0	3.0	
			CO-3	Demonstrate the data retrieval system of PubMed.	K2	3.0							3.0							3.0	3.0	
			CO-4	Perform the ORF finding and retrieval of gene information.	K3	3.0	3.0	3.0		3.0						3.0				3.0	3.0	3.0
			CO-5	Demonstrate the retrieval of structural data.	K1	3.0								3.0							3.0	3.0
<b>KBT553</b>					3.0	3.0	3.0		3.0	3.0	3.0				3.0		3.0	3.0	3.0			
43	KBT 554	V	CO-1	On completion of this course, students are able to explain mole concept and its application in biotechnological research.	K1-K2	3.0	2.0							2.0					3.0	3.0		
			CO-2	On completion of this course, students are able to calculate the various concentration of solutions such as molar, molal, normal and percent solutions.	K3	3.0	2.0	2.0							2.0				2.0	3.0	3.0	
			CO-3	On completion of this course, student will be able to evaluate the different raw materials for ethanol production.	K5	3.0	3.0	2.0	2.0	2.0	2.0	2.0		3.0					3.0	3.0	3.0	
			CO-4	On completion of this course, student will be able to implement the active dry yeast for the fermentation process using sugar cane bagasse's.	K3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	
			CO-5	On completion of this course, student will be able to explain the analytical methods for purification and estimation of ethanol concentration produced from yeast fermentation of sugarcane bagasse's.	K4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0				3.0	3.0
<b>KBT554</b>					3.0	2.6	2.5	2.7	2.7	2.7	2.7	2.5	2.6	2.5	2.5	2.5	2.7	3.0	3.0			

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44	KBT 055	V	CO-1	On completion of this course, the students will be able to understand the basic concepts of biofuel and alcohol technology.	K1-K2							3.0					3.0	3.0	3.0			
			CO-2	On completion of this course, the students will be able to understand raw material handling and its processing for biofuels and alcohol production.	K2-K3	3.0							3.0	3.0	3.0	3.0			3.0	3.0	3.0	
			CO-3	On completion of this course, the student will be able to learn the different alcoholic fermentation technology and application of various feedstocks.	K3	3.0	3.0	3.0			3.0	3.0				3.0				3.0	3.0	3.0
			CO-4	On completion of this course, the student will be able to familiarize with the concepts of metabolic pathway, recycling and quality control.	K3-K4	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0			3.0	3.0	3.0	3.0
			CO-5	On completion of this course, the student will be able to analyze the concepts of biomass conversion to bioenergy (heat and power)	K4-K5	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0			3.0	3.0	3.0	3.0
			<b>KBT055</b>						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
45	KBT 601	VI	CO-1	Comprehend the concept of media preparation, microbial growth and the associated parameters.	K2	3.0													3.0	3.0		
			CO-2	Utilize the concepts of sterilization necessary for proper bioreactor operation.	K2	3.0	3.0	3.0				3.0			3.0			3.0	3.0	3.0	3.0	
			CO-3	Discuss the basics of ideal bioreactor operations and the kinetics of microbes.	K3	3.0	3.0	3.0	3.0						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
			CO-4	Apply the concept of mass transfer, medium optimization and stoichiometric based calculations in bioprocessing.	K3	3.0	3.0	3.0	3.0	3.0										3.0	3.0	3.0
			CO-5	Analyze the concept of bioreactor control mechanism and identify suitable control system.	K4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	3.0	3.0
			<b>KBT601</b>						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
46	KBT 602	VI	CO-1	Understand the principle and basic requirements for plant tissue culture establishment.	K1-K2	3.0			2.0	3.0		3.0					3.0	3.0	3.0	3.0		
			CO-2	Explain the difference between tissue and organ culture and their applicability.	K2			2.0	2.0		3.0	2.0							2.0	2.0	3.0	
			CO-3	Understand haploid culture and compare with somaclonal variation and their utility in invitro culture.	K2-K3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0								3.0	3.0
			CO-4	Identify suitable cryopreservation and reculture techniques for the cultured tissues.	K3	3.0	2.0	3.0	3.0	2.0					2.0	3.0			2.0	2.0	3.0	3.0
			CO-5	Understand the development of transgenic plants through genetic manipulation.	K4	3.0	2.0	3.0						2.0	3.0	2.0				2.0	2.0	3.0
			<b>KBT602</b>						3.0	2.3	2.8	2.3	2.3	2.5	2.3	2.3	2.5		2.5	2.3	2.6	3.0

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47	KBT 603	VI	CO-1	Infer problems and techniques for molecular biology.	K3	3.0		3.0	2.0	3.0	3.0			3.0			3.0	2.0	3.0			
			CO-2	Speculate RNA Structure by different methods and its applications.	K2	3.0	3.0				3.0								3.0	3.0	3.0	
			CO-3	Apply machine Learning algorithms to provide solution of a biological problem.	K2	3.0		3.0	3.0	3.0	3.0	3.0				3.0		3.0	3.0	3.0	3.0	
			CO-4	Identify the basic concept of Force field in molecular modelling.	K3	2.0		3.0	3.0	2.0							3.0		2.0	3.0	3.0	
			CO-5	Assess the techniques used for management of large document collection.	K1	3.0		2.0	3.0							3.0	3.0			3.0	3.0	
			<b>KBT603</b>						2.8	3.0	2.8	2.8	2.8	3.0			3.0	3.0	3.0	2.8	2.8	3.0
48	KBT 061	VI	CO-1	Understand basics of animal tissue culture and its importance.	K1	3.0					3.0		3.0				3.0	3.0	3.0			
			CO-2	Understand the methods of cell line development, common contaminants and their application for cloned protein over production.	K2	3.0		3.0	3.0	3.0				3.0						3.0	3.0	
			CO-3	learn the strategies involved in developing clones in lab and apply animal cell culture techniques for drug development, toxicity study and its application in vaccine .	K3	3.0		3.0	3.0	3.0					3.0				3.0	3.0	3.0	
			CO-4	Apply the different types of reactors used for scale-up and their working in association with animal cell culture.	K3	3.0	3.0						3.0		3.0	3.0				3.0	3.0	3.0
			CO-5	Explain method of transgenic animal and the process of stem cell differentiation and their applications with case studies.	K4	2.0	3.0						3.0		3.0						3.0	3.0
			<b>KBT061</b>						2.8	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	3.0	3.0

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49	KBT 063	VI	CO-1	Explain the concept of role and significance of microorganisms in food.	K2	3.0	3.0											3.0	3.0		
			CO-2	Compare between various fermentation process in food biotechnology.	K2	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0				3.0	3.0	
			CO-3	Apply the knowledge of food biotechnology for Determining Microorganisms and/or their Products in Foods.	K3	3.0	3.0	3.0						3.0	3.0	3.0				3.0	3.0
			CO-4	Discuss the various food preservation methods and techniques for destroy toxicity microorganisms in food.	K4	3.0	3.0	3.0	3.0								3.0	3.0	3.0	3.0	3.0
			CO-5	Describe the Indicators of Food Safety and Quality and HACCP system.	K5	2.0													3.0	3.0	2.0
			<b>KBT063</b>			2.8	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	2.8	3.0		
50	KOE 069	VI	CO-1	ILLUSTRATE the basic human aspirations and their fulfillment in the light of resolution on the basis of the clarity of this content.	K2	3.0	3.0												3.0	3.0	
			CO-2	APPLY the understanding of co-existence to make right use of self, body and wealth in terms of enrichment, protection and right utilization and to fulfill comprehensive human goals on the basis of the clarity of this content.	K2, K3	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
			CO-3	ANALYZE reasons for harmony and contradiction in the self on the bases of their state comparing and tasting on the basis of the clarity of this content.	K2, K4	3.0	3.0	3.0						3.0	2.0	3.0			3.0		3.0
			CO-4	EVALUATE how different aspects of all encompassing resolution leads to harmony from self to nature and entire existence on the basis of the clarity of this content.	K2, K5	3.0	3.0	3.0	3.0									3.0	3.0	3.0	2.0
			CO-5	DEVELOP right understanding, right feeling, right thoughts and competence for living with the world outside in terms of behaviour, work and participation in larger order on the basis of the clarity of this content.	K2, K5, K6	3.0		2.0													2.0
			<b>KOE069</b>			3.0	3.0	2.8	3.0	3.0		3.0	3.0			3.0	3.0	2.8	2.8		
51	KNC 602	VI	CO-1	Explain the concept of Engineering and Architecture in Ancient India.	K2,		3.0			3.0	3.0	3.0	3.0			3.0		3.0	3.0		
			CO-2	Compare between Harappan Script and Brahmi Script.	K2	3.0			3.0	3.0	3.0	3.0	3.0								
			CO-3	Apply the knowledge of Textile Technology in India.	K3			3.0			3.0	2.0						3.0	3.0		3.0
			CO-4	Discuss the various Northern Indian Languages and Literature.	K3				3.0			3.0	2.0	3.0				3.0		3.0	
			CO-5	Describe the Council of Ministers, Administration and Political Ideals in Ancient India.	K4						2.0			3.0	2.0						

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				<b>KNC602</b>		3.0	3.0	3.0	3.0	2.8	2.8	2.8	2.8			3.0	3.0	3.0	3.0		
52	KBT 651	VI	CO-1	Demonstrate the growth pattern and death kinetics of <i>E. coli</i> .	K3	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0	3.0	3.0		
			CO-2	Discuss the upstream and downstream bioprocessing for product formation.	K3	3.0	3.0		3.0	3.0	3.0								3.0		
			CO-3	Analyze the mass transfer concepts in bioprocess.	K3	3.0	3.0	3.0	3.0	3.0				3.0	3.0		3.0		3.0	3.0	
			CO-4	Perform immobilization of enzymes and microbial cell.	K2	3.0	3.0	3.0	3.0	3.0				3.0	3.0		3.0				
			CO-5	Develop computational design for fermentative production.	K4	3.0	3.0		3.0	3.0				3.0	3.0		3.0	3.0	3.0	3.0	
				<b>KBT651</b>		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
53	KBT 652	VI	CO-1	Apply the concept of stock solution for preparation of MS/B5 medium and sterilization of plant tissue culture medium.	K1	3.0	3.0	3.0	3.0	3.0								3.0	3.0	3.0	
			CO-2	Select appropriate explant and their culturing and subculturing.	K2	3.0	3.0	3.0	3.0										3.0	3.0	3.0
			CO-3	Perform the callus culture by using different explant.	K3	3.0	3.0	3.0											3.0	3.0	3.0
			CO-4	Apply the concept of artificial seed for conservation of germplasm and extraction of DNA/RNA from plants.	K3	3.0	3.0	3.0												3.0	3.0
			CO-5	Perform the isolation and characterization of plant secondary metabolites from medicinal plants and extraction of proteins from plants.	K2	3.0	3.0	3.0	3.0	3.0									3.0	3.0	3.0
				<b>KBT652</b>		3.0	3.0	3.0	3.0	3.0							3.0	3.0	3.0		

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54	KBT 653	VI	CO-1	Understand the basic software and tools used in identification and structure prediction of biomolecules.	K2	2.0		3.0			3.0						3.0	3.0	3.0			
			CO-2	Conduct experimental procedure for Ramachandran plot and RMSD calculation of the proteins.	K2	3.0														3.0	3.0	
			CO-3	Analyze the best tool for studying genome annotation.	K2	3.0		3.0				3.0							2.0	3.0	3.0	
			CO-4	Construct and analyse restriction maps and QSAR model.	K3	3.0	3.0				2.0									3.0	3.0	3.0
			CO-5	Construct phylogenetic tree and design primers.	K3	3.0		3.0			3.0									3.0	3.0	3.0
			<b>KBT653</b>						2.8	3.0	3.0		2.5	3.0						2.8	3.0	3.0
55	KOE 074	VII	CO-1	Interpret basics of non conventional energy resources for society.	K2, K3	3.0	3.0	3.0		3.0						3.0		3.0	3.0			
			CO-2	Identify the importance of geo thermal energy.	K2,K3 ,K4	3.0	3.0	3.0	3.0	3.0									3.0	3.0	3.0	
			CO-3	Compare between flat plate and focusing of collectors in solar thermal energy.	K3,K4	3.0	3.0	3.0												3.0	3.0	3.0
			CO-4	Design the Thermo-electrical and thermionic Conversions for wind energy.	K2,K4 ,K5	3.0		3.0			3.0			3.0							3.0	3.0
			CO-5	Justify the requirements of fuel cells for energy generation.	K2, K5,K6	3.0		3.0					3.0	3.0						3.0	2.0	3.0
			<b>KOE074</b>						3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	3.0	2.8	3.0
56	KBT 073	VII	CO-1	On completion of this course, the students will be able distinguish the environmental pollution, types, and sources.	K3	3.0		3.0				3.0		2.0				3.0	3.0	3.0		
			CO-2	On completion of this course, the students will be able illustrate regulatory mechanisms in the area of environmental compliance laid down by various agencies.	K3	3.0					3.0	3.0		3.0					3.0	3.0	3.0	
			CO-3	On completion of this course, the students will be able examine biotechnology core principles in waste treatment system for value added products.	K4	3.0			3.0					3.0	3.0					3.0	3.0	3.0
			CO-4	On completion of this course, the students will be able evaluate the kinetic behavior of various waste treatment systems.	K5	3.0	3.0	3.0			3.0				3.0					3.0	3.0	3.0
			CO-5	On completion of this course, the students will be able design the biological system for waste treatment.	K6	2.0	3.0	3.0	3.0					3.0	3.0		3.0	2.0		3.0	3.0	3.0
			<b>KBT 073</b>						2.8	3.0	3.0	3.0	3.0	3.0	3.0	2.8			3.0	2.8	3.0	3.0
			CO-1	Student will be able to get an adequate knowledge on biosafety-regulatory framework for GMO's in India.	K3	3.0	3.0	3.0					2.0			3.0	3.0	3.0	3.0			





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S. No.	Sub Code	Sem	COx	Statement of Course Outcomes (COs)	Kx	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2			
				<b>Statement of Course Outcomes (COs)</b> Upon completion of topic concerned, students will be able to :	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Core and allied skill	Interdisciplinary skills			
59	KBT 752	VII	CO-1	Apply the knowledge and skills acquired on campus in a real-life work situation.	K2	3.0				3.0	3.0							3.0	3.0			
			CO-2	Enhance the knowledge or skills by taking the training.	K3	3.0		3.0	3.0	3.0										3.0	3.0	
			CO-3	Learn work environment, common practices, employment opportunities and work ethics in relevant field.	K2								3.0	3.0	3.0						3.0	3.0
			CO-4	Prepare quality document, presentations and can work in team effectively.	k3											3.0	3.0	3.0			3.0	3.0
			CO-5	Identify the problems and develop problem solving abilities.	k3		3.0	3.0	3.0										3.0		3.0	3.0
			<b>KBT 752</b>						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
60	KHU 701	VII	CO-1	Explain the concepts and importance of rural development.	k1									3.0					3.0	3.0		
			CO-2	Differentiate among various rural development programmes.	k3								3.0		3.0		3.0				3.0	
			CO-3	Outline the emergence and growth of Panchayati Raj Institutions in India.	k1									3.0							3.0	3.0
			CO-4	Interpret the need and elements of human resource development in the rural sector.	k3								3.0	3.0	2.0						2.0	
			CO-5	Illustrate the scope of entrepreneurship in rural area.	k3								2.0	2.0	3.0				3.0	3.0	3.0	
			<b>KHU 702</b>											2.7	2.7	2.8		3.0	3.0	2.8	3.0	
61	KBT 753	VII	CO-1	Perform literature review, identify state of the art in that field and be able define the problem.	K3	3.0	3.0	3.0						3.0	3.0	3.0	3.0	3.0	3.0	3.0		
			CO-2	Establish a methodology using advanced tools / techniques for solving the problem.	K3		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
			CO-3	Design, Develop Analytical models, Perform Numerical Analysis and interpret the results.	K3		3.0		3.0	3.0			3.0	3.0		2.0			3.0	3.0	3.0	
			CO-4	Prepare quality document of project work, Develop the skill of Viva Voce – Presentation, individual and teamwork.	K3									3.0	3.0	3.0			3.0	3.0	3.0	
			CO-5	Write paper and may be publish or patent from final thesis(Prototype, Publications, Patents).	K1						3.0				3.0	3.0			3.0	3.0	3.0	
			<b>KBT 753</b>						3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.8	3.0	3.0	3.0	3.0	
62	U 802	VIII	CO-1	Describe the key concepts and attributes that make a successful Entrepreneur.	K3										3.0				3.0	3.0		
			CO-2	Illustrate the function of an entrepreneur in a successful, commercial application of innovation.	K2																3.0	3.0
			CO-3	Integrating the learning techniques for project planning and execution control.	K2										3.0		3.0				3.0	3.0

**Statements of Course Outcomes (COs) and Mapping with Program Outcomes (POs) and Program Specific Outcomes (PSOs) : Dept. of Biotechnology : 2019-23**  
**(Batch passed-out in 2023; 2019-23) BKL # K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create**

S. No.	Sub Code	Sem	COx	Statement of Course Outcomes (COs)	Kx	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2		
				<b>Statement of Course Outcomes (COs)</b> Upon completion of topic concerned, students will be able to :	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Core and allied skill	Interdisciplinary skills		
	KH		CO-4	Identify the financing process of the entrepreneurial business.	K3											2.0		3.0	3.0		
			CO-5	Identify areas of our economy/society where social entrepreneurs work.	K1						3.0		3.0					3.0	3.0		
			<b>KHU802</b>								3.0		3.0	3.0	3.0	2.5		3.0	3.0		
63	KOE 083	VIII	CO-1	Enhancing his entrepreneurial motivation and acquiring the skills and capabilities required to play his entrepreneurial role effectively.	K2	3.0				3.0						3.0		3.0	3.0		
			CO-2	Learn about set-up relating to small industries and large businesses.	K3	3.0	3.0	3.0		2.0									3.0	3.0	2.0
			CO-3	Design project for manufacturing a product and increase the supply of entrepreneurs for quick industrial development.	K2		3.0	3.0		3.0										3.0	3.0
			CO-4	Develop skills in the preparation of balance sheets and the assessment of economic viability, business strategies, and so on.	K1	3.0		3.0	3.0					3.0						3.0	3.0
			CO-5	To develop knowledge about government policy for small and large scale industry.	K2	2.0	2.0	2.0	3.0										3.0	3.0	3.0
			<b>KOE083</b>					2.8	2.7	2.8	3.0	2.7			3.0			3.0	3.0	3.0	2.8

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S. No.	Sub Code	Sem	COx	Statement of Course Outcomes (COs)	Kx	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2			
				<b>Statement of Course Outcomes (COs)</b> <b>Upon completion of topic concerned, students will be able to :</b>	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Core and allied skill	Interdisciplinary skills			
64	KOE 094	VIII	CO-1	Understand about digital and social media marketing practices.	K2	3.0	3.0										3.0	3.0	3.0			
			CO-2	Apply knowledge of the social media in different platforms of digital and social media marketing.	K2	3.0	3.0					3.0							3.0	3.0	3.0	
			CO-3	Integrate the acquired knowledge and skill to engage consumers online.	K3	3.0	3.0													3.0	3.0	3.0
			CO-4	Analyze organizational competency by way of digital marketing practices and cost considerations.	K3	3.0														3.0	3.0	3.0
			CO-5	Develop innovative concepts using latest digital practices for marketing and promotion.	K2	3.0							3.0							3.0	3.0	3.0
			<b>KOE094</b>					3.0	3.0				3.0							3.0	3.0	3.0
65	KBT 851	VIII	CO-1	Perform literature review, identify state of the art in that field and be able define the problem.	K3	3.0	3.0	3.0						3.0	3.0	3.0	3.0	3.0	3.0	3.0		
			CO-2	Establish a methodology using advanced tools / techniques for solving the problem.	K3		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
			CO-3	Design, Develop Analytical models, Perform Numerical Analysis and interpret the results.	K3		3.0		3.0	3.0			3.0	3.0		2.0			3.0	3.0	3.0	3.0
			CO-4	Prepare quality document of project work, Develop the skill of Viva Voce – Presentation, individual and teamwork .	K3									3.0	3.0	3.0			3.0	3.0	3.0	3.0
			CO-5	Write paper and may be publish or patent from final thesis(Prototype, Publications, Patents).	K1							3.0				3.0	3.0		3.0	3.0	3.0	3.0
			<b>KBT851</b>					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.8	3.0	3.0	3.0	3.0	3.0