

22CYB01 – INTRODUCTION TO BIOCHEMISTRY (For BME Branch Only)						
			L	T	P	C
			3	0	0	3
PREREQUISITE : NIL						
Course Objective:		<ul style="list-style-type: none">• To make the students conversant with water treatment, boiler feed water techniques, energy storage devices.• To recognize the basic concepts of biotechnology, structural and basic properties of carbohydrates, lipids and clinical application of enzymes.				
Course Outcomes The Student will be able to			Cognitive Level		Weightage of COs in End Semester Examination	
CO1	Identify the types of hardness in water and its removal by various water treatment techniques.		An		20%	
CO2	Investigate on renewable energy sources like nuclear, solar, wind energy and also on storage devices.		E		20%	
CO3	Interpret the various properties of carbohydrates, lipids and fatty acids.		Ap		20%	
CO4	Analyze the factors affecting enzymatic activity by adding activators and inhibitors.		An		20%	
CO5	Predict the nature, oxidation and reduction potential of an electrode.		An		20%	

UNIT I - WATER TECHNOLOGY AND NANO MATERIALS	(9)
Municipal water treatment - disinfection methods (UV, ozonation, chlorination) - desalination of brackish water - reverse osmosis - boiler troubles (scale, sludge, priming, foaming and caustic embrittlement) - treatment of boiler feed water - internal treatment (carbonate, phosphate and calgon conditioning) - external treatment - demineralization process. Nano materials - synthesis (laser ablation, and chemical vapour deposition method), properties and applications of nanomaterials in medicine, energy, electronics and catalysis.	
UNIT II - ENERGY SOURCES AND STORAGE DEVICES	(9)
Nuclear energy - nuclear fission - nuclear fusion - light water nuclear power plants - breeder reactor - solar energy conversion - solar cells - solar water heater - wind energy - batteries - types of batteries - lead acid storage battery –lithium - ion battery, Electric vehicles - working principles.	
UNIT III - CARBOHYDRATES AND LIPIDS	(9)

Carbohydrate - classification of carbohydrates - monosaccharides - Structure: trioses - properties of monosaccharides. Disaccharides - Structure: sucrose. Oligosaccharides - Raffinose - Polysaccharides - starch. Lipids - Classification of lipids - simple - complex - derived lipids - Nomenclature of fatty acids - physical and chemical properties of fat.	
UNIT IV – ENZYMOLOGY	(9)
Enzymes - Classifications of enzymes - Kinetics of Enzymes - Michaelis - Menten equation - Factors affecting enzymatic activity - temperature - pH - concentration of substrate - Enzyme concentration - product concentration – activators - Enzyme inhibitors - reversible inhibitors - competitive - non competitive - irreversible inhibitors - active site directed irreversible inhibitors - Suicide inhibitors - Difference between reversible and irreversible inhibitors.	
UNIT V - BIOTECHNOLOGY AND ELECTROCHEMISTRY	(9)
Biotechnology - Importance - types - applications. Electrochemistry - Electrode potential - Nernst equation - derivation and problems - reference electrodes - standard hydrogen electrode -calomel electrode - potentiometric titrations (redox) - conductometric titrations (acid-base).	
TOTAL (L:45) : 45 PERIODS	

TEXT BOOKS:
<ol style="list-style-type: none"> 1. Dr.Ravikrishnan A., “Engineering Chemistry I & Engineering Chemistry II”, 13th Edition, Sri Krishna Hitech Publishing Company Pvt. Ltd., Chennai, 2020. 2. Lehninger A L., Nelson D L and Cox M M., “Principles of Biochemistry”, 4th Edition, Freeman Publishers, New York, 2017.
REFERENCES:
<ol style="list-style-type: none"> 1. Jain P C. and Monica Jain, “Engineering Chemistry”, Volume I and II, 15th Edition, Dhanpat Rai Publishing Company, New Delhi 2018. 2. Keith Wilson and John Walker, “Practical Bio Chemistry – Principles & Techniques”, Oxford University Press, 2018. 3. Donald Voet and Judith G. Voet, “Biochemistry”, 3rd Edition, Wiley, John & Sons, 2019.

Mapping of COs with POs / PSOs														
COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3		2						2					
2		2							2					
3		2							2					
4			2				2							
5						2	2					2		
CO (W.A)	3	2	2			2	2		2			2		

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