



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous Institution, Affiliated to Anna University, Chennai)
Elayampalayam, Tiruchengode – 637 205



DEPARTMENT OF BIOTECHNOLOGY

Course Code / Name : U15BTE02 - BIOENERGETICS AND METABOLISM

Class (Year / Programme / Department / Section): III/B.TECH/BT

UNIT I- BIOENERGETICS				
S.No	Topics To Be Covered	Duration in Minutes	Teaching Aid	Books Referred
1.	Laws of thermodynamics	45	BB	T2
2.	entropy, enthalpy, free energy	45	BB	T3,R1
3.	equilibrium constant	45	PPT	R1
4.	Gibbs free energy equation	45	BB	T2
5.	Biological oxidation and reduction	45	BB	R1
6.	Redox potential and phosphate potential	45	PPT	T2
7.	Thermodynamic considerations. High energy compounds	45	BB	T3
8.	Requirements of ATP for synthesis and degradation cycle	45	PPT	R1
9.	Photosynthesis - Photo systems, light and dark reactions, C3 and C4 pathways	45	BB	T1
UNIT-II -CARBOHYDRATE METABOLISM				
S.No	Topics To Be Covered	Duration in Minutes	Teaching Aid	Books Referred
10.	Carbohydrates	45	BB	T1,T2
11.	Glycolysis & Tricarboxylic acid cycle (TCA)	45	PPT	T2
12.	Glyoxylate cycle	45	BB	R1
13.	Pentose phosphate pathway (HMP) gluconeogenesis	45	PPT	T2

14.	Glycogen metabolism	45	BB	T1
15.	oxidative phosphorylation, Electron transport chain (ETC)	45	PPT	R1
16.	Chemiosmotic theoryoxidative phosphorylation	45	BB	T1,T2
17.	inhibitors and un- couplers of electron transport chain and function of ATPase	45	PPT	T3
18.	Shuttle systems.	45	BB	T2

UNIT-III- PROTEIN METABOLISM

S.No	Topics To Be Covered	Duration in Minutes	Teaching Aid	Books Referred
19.	Proteins	45	PPT	R1
20.	Urea cycle	45	BB	T1,T2
21.	Biosynthetic	45	PPT	T3,R1
22.	Degradative pathway of amino acids	45	BB	T2,R1
23.	Protein synthesis	45	BB	T2
24.	degradation	45	BB	R1
25.	Different levels of regulation	45	PPT	T3
26.	Allosteric regulation	45	BB	T1,R1
27.	feedback regulation proteolytic processing.	45	BB	T2
28.	Applications of feedback regulation	45	BB	T1

UNIT-IV- LIPID METABOLISM

S.No	Topics To Be Covered	Durationin Minutes	Teaching Aid	Books Referred
29.	Introduction	45	PPT	T2
30.	Fatty acids metabolism	45	BB	R1
31.	Biosynthesis of fatty acids	45	PPT	T3,R1
32.	oxidation pathway	45	BB	T2,R1

33.	Ketone bodies	45	PPT	R1
34.	Control of metabolism	45	BB	R1
35.	Biosynthesis and degradation of cholesterol.	45	BB	T3
36.	A Case Study	45	BB	T2
UNIT- V- NUCLEIC ACID METABOLISM				
S.No	Topics To Be Covered	Duration in Minutes	Teaching Aid	Books Referred
37.	Introduction	45	BB	R1
38.	Biosynthesis of purine	45	BB	T3
39.	Nucleotides (adenine, guanine)	45	BB	T1,T2
40.	Biosynthesis of pyrimidine	45	PPT	R1
41.	Nucleotides (cytosine, thymine, and uracil)	45	BB	T1
42.	Catabolism of adenine, guanine	45	PPT	T2
43.	Catabolism of cytosine, thymine, and uracil	45	BB	R1
44.	Metabolic disorders associated with purine metabolism	45	BB	T2,R1
45.	Metabolic disorders associated with pyrimidine metabolism	45	BB	T3,R2

TEXT BOOKS:

1. Voet and Voet. Biochemistry. John Wiley and Sons, Singapore, 4th Edition, 2010.
2. Murray. R.K, Granner.D.K, Mayes. P. A, Rodwell. V. W. Harper s Biochemistry. McGraw Hill, 27th Edition, 2006.
3. Lehningers, A.L. Nelson., D.L., Cox, M.M., Principles of Biochemistry, Worth Publishers, London,6th Edition, 2012

REFERENCE:

1. Stryer, L.Berg., J.M.Tymoczko., J.L., Biochemistry, W.H. Freeman Co., New York, 5th Edition, 2002.
2. Zubay, G., Biochemistry, McGraw Hill Publishers, New Delhi, 4th Edition, 1999..