Core Course

LS 451—BIOCHEMISTRY-II [2 credits]

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S No	Topic	Contact Hours
1.	Metabolism: Basic concepts, Central role of ATP in metabolism, Carbon fuel and its oxidation, Concept of energy rich compounds and intermediates, Common types of reactions involved in metabolism	
2.	Glycolysis and gluconeogenesis, Energetics and ATP productions	
3.	Regulation of glycolysis, glycogen synthase, metabolic flux and its regulation by various metabolic intermediates	
4.	TCA cycle, its regulation, its role in energy generation, its role in generating biosynthetic intermediates, glyoxylate cycle	
5.	Redox reaction, mitochondrial structure and its role in energy metabolism, electron transport system	
6.	ATP synthesis and chemo-osmotic hypothesis of ATP generation	
7.	Pentose phosphate pathway and its importance in biosynthetic reactions	
8.	Glycogen synthesis, breakdown and its regulation	
9.	Fatty acid biosynthesis and degradation	
10.	Synthesis and degradation of steroids	
11.	Amino acid metabolism, Urea cycle, one carbon reaction, non-protein amino acids, amines and their role in cell function	
12.	Nucleotide biosynthesis and metabolism, salvage pathways, its regulation and diseases	
13.	Special topics in biochemistry. Mechanisms of hormone action, Role of post- translation modifications in regulation of cell function, Muscle contraction and cell motility	

Suggested reading:

1. Biochemistry (5th Edition) by Jeremy Berg, John Tymoczko and LubertStryer,
2. Biochemistry (3rd Edition) by Donald J. Voet and Judith G. Voet.
3. Lehninger Principles of Biochemistry (4th Edition) by David L. Nelson andMichael M. Cox.