

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 (SLP)
2.	Glycolysis and gluconeogenesis, Energetics and ATP productions	2 (SLP)
3.	Regulation of glycolysis, metabolic flux and its regulation by various metabolic intermediates	2 (SLP)
4.	TCA cycle, its regulation, its role in energy generation, its role in generating biosynthetic intermediates, glyoxylate cycle	2 (SLP)
5.	Redox reaction, mitochondrial structure and its role in energy metabolism, electron transport system	4 (VY)
6.	ATP synthesis and chemo-osmotic hypothesis of ATP generation	2 (VY)
7.	Pentose phosphate pathway and its importance in biosynthetic reactions	2 (SLP)
8.	Glycogen synthesis, breakdown and its regulation	3 (SLP)
9.	Fatty acid biosynthesis and degradation	3 (SLP)
10.	Synthesis and degradation of steroids	2 (SLP)
11.	Amino acid metabolism, Urea cycle, one carbon reaction, non-protein amino acids, amines and their role in cell function	3 (VY)
12.	Nucleotide biosynthesis and metabolism, salvage pathways, its regulation and diseases	3 (VY)
13.	Special topics in biochemistry. Mechanisms of hormone action, Role of post- translation modifications in regulation of cell function, Muscle contraction and cell motility	2 (VY)

Suggested reading:

1. Biochemistry by Jeremy Berg, John Tymoczko and Lubert Stryer
2. Biochemistry by Donald J. Voet and Judith G. Voet
3. Lehninger Principles of Biochemistry by David L. Nelson and Michael M. Cox