Core Course

LS 451—BIOCHEMISTRY-II [2 credits]

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

Suggested reading:

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