

## LSC 451 - BIOCHEMISTRY- II

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, Urea cycle, Regulation of glycolysis, glycogen synthase, metabolic flux and its regulation by various metabolic intermediates, Glycogen synthesis, breakdown and its regulation.
3. Energetics, ATP synthesis and chemo-osmotic hypothesis of ATP generation.
4. TCA cycle, its regulation, its role in energy generation, its role in generating biosynthetic intermediates, glyoxylate cycle.
5. Amino acid metabolism, active carbon reaction, non-protein amino acids, amines and their role in cell function.
6. Synthesis of purine and pyrimidine, Nucleotide biosynthesis and metabolism, salvage pathways, its regulation and diseases.
7. Redox reaction, mitochondrial structure and its role in energy metabolism, electron transport system.
8. Pentose phosphate pathway and its importance in biosynthetic reactions.
9. Fatty acid biosynthesis and degradation.
10. Synthesis and degradation of steroids and glycolipids.
11. Synthesis of secondary metabolites, such as alkaloids, non-protein amino acids, amines, cyanogenic glycosides, glucosinolates, lignin, suberin, terpenoids and phenolics.

### **Suggested readings**

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