BSS455 METABOLISM AND BIOENERGETICS

Course Outcomes:

After successful completion of the course, students will be able to :

CO 1. Understand the mechanisms and regulation of anabolic and catabolic processes

CO 2. Know various disorders associated with metabolic pathways.

CO 3. Understand the physiological importance and metabolism of vitamins.

CO 4. Comprehend the concept of bioenergetics and thermodynamic principles in biology.

Unit I (13 hours)

Overview of metabolism, Metabolism of carbohydrates, pathways and regulation, gluconeogenesis, glycogenolysis, anaerobic glycolysis, citric acid cycle, hexose monophosphate shunt. Metabolism of lipids, Biosynthesis of fatty acids, Oxidation of fat and fatty acids, beta, alpha and omega oxidation, ketogenesis and ketolysis, metabolisms of acylglycerols and sphingolipids, cholesterol synthesis, transport and excretion, lipoprotein metabolism

Unit II (13 hours)

Protein and amino acid metabolism, nitrogen balance, transamination and deamination, catabolisms of aromatic and sulphur containing aminoacids, urea cycle and disorders, Metabolisms of purines and pyrimidines, metabolism and functions of fat soluble A, D, E and K and water soluble B complex (B1, B2, B3, B5, B6, B7, B9 and B12) & C vitamins

Unit III (13 hours)

Bioenergetics, Thermodynamic principles in biology, Concept of free energy. Energy rich bonds, Coupled reactions, Electron transport chain, oxidative phosphorylation, group transfer, Biological energy transducers, inhibitors of electron transport chain, uncouplers