



**MANGALORE UNIVERSITY**

**DEPARTMENT OF BIOSCIENCES**

**MSc Food Science & Nutrition**

**FNS 404 NUTRITIONAL BIOCHEMISTRY**

**39 hr (13× 3 units)**

**Course Outcome:**

- Describe macronutrients, energy metabolism, its utilization, and the general functions.
- Understand nucleotides, structure and its properties
- Identify biological oxidation and electron transport chain taking place in an organism.
- Describe the classification, nomenclature and other basic concepts of enzymes and hormones.

**Unit I:** Nutrient metabolism: Carbohydrates - Glycolysis, TCA Cycle, HMP shunt, Energy metabolism, energy production, gluconeogenesis, glycolysis. Proteins and Amino acids: Synthesis, metabolism, denaturation, transamination, decarboxylation, urea formation, synthesis and break down of hemoglobin. Functions and classification of nucleotides, structure and properties of RNA and DNA. Lipids: Synthesis of saturated and unsaturated fatty acids, cholesterol synthesis and regulation, oxidation of saturated and unsaturated fatty acids, phospholipids and lipoproteinsynthesis.

**Unit II:** Biological oxidation and Electron Transport Chain: Reduction potentials, anatomical site and components of oxidative phosphorylation, enzymes involved, membrane location of electron transport, chemiosmotic theory, inhibitors of respiratory chain

**Unit III:** Enzymes and Hormones: Enzymes - Classification, nomenclature, general properties- stereo and reaction specificity, kinetics and mechanisms of enzyme action, regulation of enzyme activity. Coenzymes and co factors, their structure and functions. Enzyme inhibition, isoenzymes, immobilized enzymes, estimation of enzyme activity, clinical significance of enzymes and enzyme based assays. Hormones - Classification, regulatory functions and mechanisms of hormone action. Prostaglandin - structure, biosynthesis, metabolism and biological action and their role in pathology.

**REFERENCES**

- Raghuramulu N., Madhavan Nair K and Kalyansundaram S. 1983.A manual of laboratory techniques edited by.NINICMR
- Tietz NW (Ed). 1976. Fundamentals of clinical chemistry, WB SaundersCo.
- Jain J.L. Fundamentals of biochemistry, S. Chand & Company Ltd, Ram NewDelhi
- Delvin T M., Text book of biochemistry with clinical correlation, Wiley LissInc
- Murray R K., D K Granner, P A Mayes, V W Rodwell Harpers biochemistry, Macmillan Worth Publishers