

**NUTRITIONAL BIOCHEMISTRY**

Marks: 150

**THEORY**

Marks: 100

Teaching Period: 4 Theory + 1 Interactive Period/ week

**Objectives**

This course will enable the student to

- Understand the objective, scope and principles of Biochemistry (as applicable to human nutrition).
- Understand the biological processes and systems as applicable to nutrition.

**Content**

**Periods**

**Unit I: Carbohydrate Metabolism**

**22**

- Regulation of enzymes- allosteric, covalent modification and gene expression
- Carbohydrate structures
- Citric Acid Cycle and ATP synthesis
- Glycolysis and oxidation of pyruvate
- Glycogenolysis
- Gluconeogenesis and the control of blood glucose

**Unit II: Lipid Metabolism**

**12**

- Fatty acids
- $\beta$ -Oxidation of fatty acids
- Ketogenesis and ketosis

**Unit III: Protein Metabolism**

**10**

- Structures of amino acids and proteins
- Transamination of amino acids and formation of glutamate
- Biosynthesis of urea

**Unit IV: Vitamins**

**12**

- Biochemical role of fat soluble vitamins-A and D
- Biochemical role of water soluble vitamins- Thiamine, Riboflavin, Niacin, Pyridoxine and Ascorbic acid

**Recommended Readings**

- Harper's Illustrated Biochemistry, 28<sup>th</sup> Edition, McGrawHill
- Lehninger A.L, Nelson D.L and Cox M.M (2009). Principles of Biochemistry, 6<sup>th</sup> Edition, CBS Publisher and Distributors.

## PRACTICAL

Marks: 50

Teaching Periods: 4/ week

### Objectives

This course will enable the student to understand:

1. Quantitative estimation of carbohydrates
2. Quantitative estimation of vitamins
3. Quantitative estimation of minerals

### Content

### Periods

#### 1. Carbohydrates

2

- Estimation of glucose (Spectrophotometry)

#### 2. Minerals

4

- Estimation of calcium using EDTA by titration

#### 3. Vitamins

8

- Estimation of ascorbic acid content in the given solution and in the given foodstuff ( lemon ) by modified titrimetric method of Bessey.
- Estimation of ascorbic acid content in the given foodstuff tomato or spinach leaves by modified titrimetric method of Bessey
- $\beta$  carotene estimation by spectrophotometry,

### Recommended Readings

- Pushpa Sundararaj and Anupa Siddhu. Qualitative tests and Quantitative Procedures in Biochemistry, A H Wheeler and Co Ltd. 2002 Second Edition, Wheeler, New Delhi.