UNIVERSITY OF LADAKH

SYLLABUS

OF

THE INTER-DISCIPLINARY COURSE

OF

BIOCHEMISTRY

(UNDER NEP – 2020)

(Implemented w.e.f Academic Session 2023-24)

UNIVERSITY OF LADAKH

SYLLABUS OF THE INTER-DISCIPLINARY COURSE IN BIOCHEMISTRY
UNDER NATIONAL EDUCATION POLICY - 2020
(Session 2023-2024)

Objective
To impart knowledge regarding the biochemical aspects of various nutrients and their significance in food and health.

SEMESTER: I **(3 credit)**
COURSE TITLE: Nutritional Biochemistry and Health
COURSE CODE: LFS-BC-101-G

UNDERGRADUATE INTER-DISCIPLINARY COURSE IN BIOCHEMISTRY NEP-2020)

UNIT 1: Introduction to Nutrition and Energy Metabolism I

Fundamentals of human nutrition, concept of balanced diet, biochemical components of diet, ideal, under and over nutrition, Basal Metabolic Rate (BMR), factors affecting BMR and significance of BMR. Functional and nutritional characteristics of Carbohydrates, Proteins, Fats

UNIT 2 II: Nutrition And Health

Nutritional requirements for different age groups and physiological status, factors effecting nutritional requirements. Diseases due to diet deficiency, antioxidants, food toxins, anti-nutritional factors, probiotics and cultured dairy products.

UNIT III: Micronutrients: Vitamins

Vitamin A, D, E, K Dietary sources, RDA, Adsorption, Distribution, Deficiency. Role of Vitamin A as an antioxidant, in Visual cycle, dermatology and immunity. Role of Vitamin E as an antioxidant. Extra-skeletal role of Vitamin D and its effect on bone physiology. Hypervitaminosis. Vitamin C- Dietary sources, RDA, Adsorption, Distribution. The B Complex vitamins- Dietary sources, RDA, Adsorption, Distribution.

SEMESTER: II **(3 credit)**
COURSE TITLE: Biochemistry of Cell
COURSE CODE: LFS-BC-201-G

Objective: To familiarize the students with major biomolecules namely carbohydrates, lipids, amino acid, peptides and nucleic acids which are important for the structural organization and functions of the cells.

UNIT I

Introduction: The cellular basis of life. Cellular structures – prokaryotes and eukaryotes. Role of water in design of biomolecules. Carbohydrates: Definition and classification. Structure, distribution and functions of important derivatives of monosaccharides, disaccharides, polysaccharides (Glycans); storage polysaccharides.

UNIT II

Amino Acids and Peptides: Types of amino acids and their chemistry, Acid base properties of amino acids, derivatives of amino acids and their biological role. Introduction to biologically important peptides. Metal ion containing biomolecules - heme, porphyrins and cyanocobalamin; their biological significance.

UNIT III

Lipids: Definition and classification. Fatty acids (structures and nomenclature). Essential fatty acids. Physical and chemical properties of fatty acids, storage lipids, structural lipids in membranes. DNA structure, different types of RNA

Essential reading

Textbook of Biochemistry with Clinical Correlations (2011) Devlin, T.M. John Wiley & Sons, Inc. (New York), ISBN: 978-0-4710-28173-4.
2. Krause's Food and Nutrition Care process.(2012); Mahan, L.K Strings, S.E, Raymond, J. Elsevier's Publications. ISBN- 978-1-4377-2233-8.
3. The vitamins, Fundamental aspects in Nutrition and Health (2008); G.F. Coombs Jr. Elsevier's Publications. ISBN-13- 978-0-12- 183493-7.
4. Lehninger's Principles of Biochemistry, Nelson and Cox, W.H.Freeman and company, New York. 8th Edition (2021).
5. Biochemistry, Satyanarayana and Chakrapani, Arunabha Sen Books and Allied (P)Ltd 5th Edition (2020).

Suggested reading

1. Principles of Nutritional Assessment (2005) Rosalind Gibson. Oxford University Press. ISBN: 9780195171693
2. *Nutritional Biochemistry*. Author, *Tom Brody*. Edition, 2. Publisher, Harcourt Braces, 1999. ISBN, 9814033251, 9789814033251.
3. Fundamentals of Biochemistry, Jain and Jain,S.Chand. 7th edition (2016).
4. Voet's Principles of Biochemistry, Voet and Voet, 5th Edition (2018).

Note: Students can opt for any skill courses provided by the college.