

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE HH 8B2: NUTRITIONAL BIOCHEMISTRY-II

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Nutritional Biochemistry -II DSE HH 8B2	4	2	0	2	Studied Semester VII	Studied Nutritional Biochemistry I DSE HH 5B1

Learning Objectives

- To attain knowledge on basic concepts of biochemistry.
- To obtain an insight into the role and significance of enzymes
- To develop an understanding of metabolism.

Learning Outcomes

- Develop an understanding of the principles of biochemistry (as applicable to human nutrition).
- Obtain an insight into chemistry of enzymes and major nutrients and physiologically important biomolecules.
- Understand the biological processes and systems as applicable to nutrition.
- Apply the knowledge acquired to human nutrition and dietetics.

SYLLABUS OF DSE HH 8B2

THEORY
(Credits 2; Hours 30)

UNIT I: Enzymes

6 Hours

- Basic concepts-apoenzyme, holoenzyme, cofactor, prosthetic groups, concept of active site; allosteric enzymes
- Effect of pH, temperature, substrate concentration (K_m and V_{max}) on enzyme activity, Michaelis-Menton equation, Lineweaver-Burk plot
- Enzyme inhibition: Competitive and non-competitive.

UNIT II: Carbohydrate Metabolism**10 Hours**

- Glycolysis
- Gluconeogenesis
- Pentose Phosphate Pathway
- Glycogenolysis
- Citric Acid Cycle
- Control of blood glucose (Metabolic-Hexokinase and Glucokinase and Hormonal-Insulin and glucagon/epinephrine)

UNIT III: Lipid Metabolism**4 Hours**

- β -Oxidation of saturated fatty acids
- Ketogenesis and ketosis

UNIT IV: Protein Metabolism**5 Hours**

- Transamination of amino acids; Formation of glutamate and glutamine
- Urea cycle

UNIT V: Nucleotide Metabolism**5 Hours**

- Structure of Nucleotides.
- Catabolism of purine and pyrimidine nucleotides

PRACTICAL
(Credit 2; Hours 60)

1. Preparation of normal and molar solutions.
2. Preparation of buffer (phosphate/ acetate).
3. Assay of enzyme (salivary amylase/ alkaline phosphatase).
4. Effect of pH/ temperature on enzyme activity.
5. Estimation of protein using Biuret method.
6. Estimation of cholesterol.
7. Quantitative estimation of DNA.
8. Quantitative estimation of RNA.
9. Assignment on disorders of carbohydrate/ protein/ nucleotide metabolism.

Essential Readings:

- Rodwell, Victor W., David Bender, and Kathleen M. Botham. Harper's Illustrated Biochemistry (31st ed.) New York: McGraw-Hill Medical.
- Nelson, D. L. and Cox, M. M. (2021). Lehninger Principles of Biochemistry (7th ed.). Macmillan Learning.
- Satyanarayana, U & Chakrapani U. (2021). Biochemistry (6th ed.). Elsevier.

- Devlin TM. (2010) Textbook of biochemistry with Clinical Correlations (7th ed.) John Wiley and Sons.

Suggested Readings:

- Stryer, L., Berg, J., Tymoczko, J., Gatto, G. (2019). Biochemistry (9th ed.). New York, WH: Freeman. ISBN-13: 9781319114671.
- Voet, D., Voet. J. G. (2013). Biochemistry (4th ed.). New Jersey, John Wiley & Sons Asia Pvt. Ltd. ISBN: 978-1-11809244-6.
- Plummer, D. T. (1998). An Introduction to Practical Biochemistry. (3rd ed.). Tata McGraw Hill Education Pvt. Ltd. (New Delhi). ISBN: 13: 9780070994874 / ISBN:10: 0070994870.
- Garret, R.H., Grisham, C.M. (2016). Biochemistry (6th ed.). Boston, Cengage Learning. ISBN-10: 1133106293, ISBN-13: 978-1133106296.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.