

ALLIED COURSES

SEMESTER: 1

SEMESTER: 1 PART:IV	NUTRITIONAL BIOCHEMISTRY	CREDIT:4 HOURS/WEEK :4
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COURSE OBJECTIVE:

The learners will be able to

- 1) Understand the role of enzymes in metabolism and clinical conditions.
- 2) Interpret the significance of macronutrient metabolism, and thereby understand the implications of disorders resulting from these.
- 3) Acquire skills in qualitative tests and quantitative estimation of nutrients
- 4) Understand about amino acid.
- 5) Acquire knowledge about different metabolism.

UNIT I INTRODUCTION TO BIOCHEMISTRY:

Definition and relation to nutrition, Enzyme classification, Nomenclature, Factors affecting enzymatic activity, Mechanism of action. Co- enzyme and prosthetic group- role of B vitamins.

UNIT II CARBOHYDRATE:

Structure, General reactions of mono, di, tri and oligo saccharides, interconversion of sugars, Metabolism of carbohydrate –glucose oxidation through Glycolysis, Krebs-TCA cycle, Pentose Phosphate Pathway, Gluconeogenesis. Inborn errors of metabolism - Fructosuria and galactosemia- in brief.

UNIT III AMINO ACIDS:

Classification, chemical properties due to amino and carboxyl groups. Chromatographic separation. Proteins-primary, secondary, tertiary structure of proteins, Hydrolysis of proteins-Denaturation, precipitation, coagulation. Nutritional classification of proteins General pathways of metabolism of amino acids-Deamination, transamination, decarboxylation – urea cycle, fate of carbon skeleton of amino acids. Inborn errors of metabolism-Phenyl ketonuria, Alcaptonuria, Maple Syrup Urine Disorder

UNIT IV LIPIDS AND LIPID METABOLISM:

Classification of fats, oxidation of fatty acids, Bio synthesis of fatty acids, ketogenesis. Nutritional importance of Saturated and Unsaturated fatty acids, Triacylglycerols, Phospholipids and Cholesterol

UNIT V Nucleic acids:

Structure and Functions Inter relationship between carbohydrate, fat and protein metabolism – Hormonal regulation of metabolism. Tamilnadu State Council for Higher Education

COURSE OUTCOMES:

- 1) Acquire knowledge on role of carbohydrate in human health
- 2) Develop knowledge on protein and their effect
- 3) Understand nutritional important of lipids
- 4) Develop skills to analyse inter relationship between carbohydrate, fat and protein metabolism
- 5) Acquire knowledge on composition of body fluids and ways to regulate for normal levels

Text book:

- 1) Conn, E.E. and Stumpf, P.K. (1981) Outlines of Biochemistry. 4th ed. Wiley Eastern Ltd., New Delhi.
- 2) Harvey, R. and Ferrier, D., Lippincott's Illustrated Reviews: Biochemistry 6th edition, Lippincott Williams and Wilkins, Philadelphia.
- 3) Lehninger, A.L. (1993) Biochemistry. 3rd ed. CBS Publishers, New Delhi.

Supplementary Readings

- 1) Murray, R.K., Granner, D.K. and Rodwell, V. W. (2006) Harper's Illustrated Biochemistry.
- 2) 27th ed., The McGraw-Hill Companies, Inc., USA.
- 3) West, E.S., Todd, W.R., Mason, H.S. and Van Bruggen, J.T. (1970) Text book of Biochemistry. 4th ed. The Macmillan Co., New York.
- 4) Shanmugham Ambika (1985) Fundamentals of bio-chemistry to medical students. NVA Bharat Printers, and traders 56, Peters Road, Madras-86. .

OUTCOME MAPPING

	PO1	PO2	PO3	PO4	PO5
CO1	2				
CO2		2			
CO3			2		
CO4				2	
CO5					2

ALLIED PRACTICAL - I

SEMESTER: I PART: III	NUTRITIONAL BIOCHEMISTRY PRACTICAL	CREDIT: 3 HOURS/WEEK :3
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COURSE OBJECTIVES

- 1) Demonstrate practical skills necessary to conduct laboratory based tests
- 2) Understand the reactions of nutrients through qualitative experiments
- 3) Get training on quantitative analysis of various biochemical parameters in body fluids
- 4) Describe selected and relevant biochemical techniques
- 5) Knowledge on different types of estimation.

Practical

- 1) Quantitative analysis of biochemical parameters in body fluids – blood, serum and urine
- 2) Qualitative tests for carbohydrate – glucose, fructose, lactose, maltose and unknown sugar
- 3) Quantitative tests for sugar profile – total sugar, reducing and non-reducing sugar
- 4) Qualitative tests for proteins – albumin, casein and gelatin
- 5) Qualitative tests for amino acids – tyrosine, cysteine, methionine, tryptophan
- 6) Quantitative tests for polysaccharides – starch and fibre

Experiments

- 1) Estimation of urinary creatinine
- 2) Estimation of urinary urea - diacetyl monoxime method.
- 3) Estimation of serum protein - Biuret method.
- 4) Estimation of iron and haemoglobin
- 5) Estimation of glucose - 4Orthotoluidine method
- 6) Reactions of glucose
- 7) Reactions of fructose
- 8) Reactions of galactose
- 9) Reactions of maltose
- 10) Reactions of lactose
- 11) Reactions of sucrose
- 12) Analysis of unknown sugar
- 13) Estimation of total sugar
- 14) Estimation of starch and fibre
- 15) Estimation of amino acids
- 16) Visit to laboratory
- 17) Final practical examination

COURSE OUTCOMES

- 1) Acquire skills in qualitative tests and quantitative estimation of nutrients
- 2) Quantitatively analyse the biochemical parameters in blood, serum and urine samples
- 3) Qualitatively identify the presence of macronutrients
- 4) Demonstrate the various analytical techniques
- 5) Empower knowledge on different methods of estimation.

Text Books

- 1) Sharma DC, Devanshi Sharma (2017), Nutritional Biochemistry, CBS Publishers & Distributors.
- 2) Ramadevi. (2016). Ambika Shanmugam's Fundamentals of Biochemistry for Medical Students. (8 ed.). India: Wolter Kluwer.
- 3) Deb, A.C. (1999), Fundamentals of Biochemistry, New Central Book Agency (P) Ltd., Calcutta
- 4) Bender, D., Rodwell, V. W., Botham, K. M., Weil, P. A., Kennelly, P. J. (2018). Harper's Illustrated Biochemistry. (31st ed.). Thirty-First Edition. United States: McGraw-Hill Education.
- 5) Fearon, W. R. (2014). An Introduction to Biochemistry. Netherlands: Elsevier Science.
- 6) Conn, E. E., Stump, P. K., Bruening, G. & Doi, R.H. (2009). Outlines Of Biochemistry. (5th ed.). India: Wiley India Pvt. Limited
- 7) Satyanarayana, U. (2006). Biochemistry (3rd ed.). Kolkata: Books and Allied (P) Ltd.

Supplementary Readings:

- 1) Nelson, D. L., & Cox, M. M. (2017). Lehninger Principles of Biochemistry (7th ed.). W.H. Freeman.
- 2) Vasudevan, D. M., S, S., Vaidyanathan, K. (2016). Textbook of Biochemistry for Medical Students. India: Jaypee Brothers, Medical Publishers Pvt. Limited.
- 3) AmbikaShanmugam (2012) Fundamentals of Biochemist
- 4) Devlin, T. M. (2011). Textbook of biochemistry: With clinical correlations. Hoboken, NJ: John Wiley & Sons.
- 5) Satyanarayana, U Chakrapani (2008) – Fundamentals of Biochemistry, Books & Allied publishers, Calcutta
- 6) Rama Rao, A. V. S. S. (2006). A Textbook of Biochemistry. India: UBS Publishers' Distributors Pvt. Limited.
- 7) Alistair F. Smith, Geoffrey J. Beckkett, Simon W. Walker, Peter W.H. Rae (2005), Clinical Biochemistry, 6th edition, Replika Press pvt Ltd, India.
- 8) Talwar, G. P., Sri Vatsava, L. N. & Moudgil, K. D. (1989). Text book of Biochemistry and Human Biology. New Delhi, ND: Prentice Hall of India (P) Ltd.

OUTCOME MAPPING

	PO1	PO2	PO3	PO4	PO5
C01	2				
C02		2			
C03			2		
C04				2	
C05					2

SEMESTER – II

SEMESTER: II PART:III	FOOD PRODUCT DEVELOPMENT	CREDIT:4 HOURS/WEEK:4
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COURSE OBJECTIVES

To enable the students to

1. Develop new marketable, nutritionally and economically viable food products.
2. Create entrepreneurship skills for setting up small scale food industries.
3. Understand packaging of different food products.
4. Analyze financial management and marketing food products.
5. Knowledge about standardization of food product.

UNIT - I Trends in Food Consumption pattern:

Economical, Psychological and Sociological Dimensions of Food Consumption patterns. Trends in Social Change as a Base for New Product Development

UNIT – II: Food Components:

Types of Food Processing, Status of Food Processing Industry in India and Scope of Growth in Future, Principles and Purpose of New Product Development, Product Design and Specifications.

UNIT – III: Traditional Foods:

Weaning Foods, Convenience Foods, RTE, RTS, Extruded foods, IMF Foods, Specialty Products, Health foods, Nutritional Supplements, Functional Foods, Nutraceuticals and Designer Foods, Sports Foods, Foods for Defence Services, Space foods.

UNIT-IV: Standardization,

Portion size, Portion Control, Quantity Cooking, Shelf Life Evaluation- Sensory and Microbial Testing of Processed Foods, Nutrient Analysis. Suitable Packaging Materials for Different Foods, SWOT Analysis

UNIT–V: Institutional Support (Training and Finance) for Entrepreneurship Development.

Financial Institutions (Central and State Government) banks/Funding Agencies, Financial Accounting Procedures, Book Keeping, Market Research, Marketing Strategies, Cost Calculation , Advertising Methods, Product sales, Product License, Legal specifications, Consumer Behaviour and Food Acceptance.

COURSE OUTCOME

- 1) Apply the principles of quality assurance, and food safety to a food product design
- 2) Gain skills to develop a new food product
- 3) Produce elements of HACCP-based food safety program that is applicable to the production of a new food product
- 4) Work collaboratively with others on a major investigative project
- 5) Develop skills in entrepreneurial management.

Text book

- 1) Sudhir Gupta (2007) Handbook of Packaging Technology, Engineers India Research Institute, New Delhi
- 2) Khanaka, S.S., Entrepreneurial Development, S. Chand and Company Ltd, New Delhi, 2006.
- 3) Suja, R. Nair(2004) Consumer Behaviour and Marketing Research, 1st Edition, Himalaya Publishers.

Supplementary Readings

- 1) Hmacfie, (2007) Consumer led Food Product Development, Weed head Publishing Ltd., UK
- 2) 2.Fuller, Gordon, W(2005) New Food Product Development, 2nd Edition, CRC Press, Boca Raton, Florida.
- 3) Schaffner .D,J, Schroder , W.R.(2000)Food Marketing and International Perspectives, eb/McGraw Hill Publication

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	PO1	PO2	PO3	PO4	PO5
C01	2				
C02		3			
C03			2		
C04				2	
C05					2

ALLIED PRACTICAL - I

SEMESTER: II PART: III	NUTRITIONAL BIOCHEMISTRY PRACTICAL	CREDIT: 3 HOURS: 3HOURS/WEEK
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