

ANNEXURE E

FACULTY OF SCIENCES

SYLLABUS FOR THE

SUBJECT: CHEMISTRY

For the award of the Degree in

Bachelor of Science Home Science (Three Year Degree Programme)

(Credit Based Continuous Evaluation Grading System)

Under NEP-2020

Semester V

Session: 2025-26



**The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(AUTONOMOUS)**

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)
SCHEME AND CURRICULUM OF EXAMINATION OF FOUR YEAR UNDER
GRADUATE DEGREE PROGRAMME

Bachelor of Science Home Science (Three Year Degree Programme)

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2025-26)

Bachelor of Science Home Science (Three Year Degree Programme)										
Semester-V										
Course Code	Course Title	Course Type	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Marks				Examination time (in Hours)
						Total	Th	P	CA	
BHSL-5083	Basic Nutritional Biochemistry	C	3-0-0	3-0-0	3	75	60	-	15	3

Bachelor of Science Home Science (Three Year Degree Programme)

Credit Based Continuous Evaluation Grading System (CBCEGS)

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(Session: 2025-26)

(Semester V)

COURSE CODE: BHSL-5083

COURSE TITLE: Basic Nutritional Biochemistry

Course outcomes:

Students will be able to:

CO1: Explain the structural formulae of monosaccharides, disaccharides, and polysaccharides, and relate their structure to biological function.

CO2 : Interpret the structural composition of fatty acids, triglycerides, and phospholipids, and evaluate factors affecting fat stability including rancidity, acid value, and saponification value.

CO3 : Illustrate the major pathways of carbohydrate and lipid metabolism, including glycolysis, TCA cycle, gluconeogenesis, and fatty acid biosynthesis and oxidation.

CO4 : Describe the metabolic roles and regulatory mechanisms of inorganic elements such as calcium, phosphorus, magnesium, and iron in the human body.

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(Under NEP 2020)

(Session: 2025-26)

(Semester V)

COURSE CODE: BHSL-5083

COURSE TITLE: Basic Nutritional Biochemistry

Exam Time: 3Hrs.

Credit (L-T-P): 3-0-0

Max. Marks: 75

(Theory: 60, CA: 15)

Instructions for the Paper Setters: Eight questions of equal marks (twelve marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT I

Structural formulae of monosaccharides, disaccharides and polysaccharides.

UNIT II

Structural formula of fatty acids, triglycerides and phospholipids.

Rancidity of fat & its prevention.

Acid value and saponification value of fat.

Essential fatty acid.

UNIT III

Intermediary Metabolism of Carbohydrates

Glycolysis TCA Cycle, Gluconeogenesis.

Study of intermediary metabolism of fat oxidation and biosynthesis of fatty acids.

UNIT IV

Metabolism of inorganic elements calcium, phosphorus, magnesium and iron

Books Suggested

- 1) Nelson, D. L., & Cox, M. M. (2021). *Lehninger principles of biochemistry* (8th ed.). W.H. Freeman and Company.
- 2) Berg, J. M., Tymoczko, J. L., & Stryer, L. (2019). *Biochemistry* (9th ed.). W.H. Freeman and Company.
- 3) Satyanarayana, U., & Chakrapani, U. (2021). *Biochemistry* (5th ed.). Elsevier India.
- 4) Vasudevan, D. M., Sreekumari, S., & Vaidyanathan, K. (2020). *Textbook of biochemistry for medical students* (9th ed.). Jaypee Brothers Medical Publishers.
- 5) Rodwell, V. W., Bender, D. A., Botham, K. M., Kennelly, P. J., & Weil, P. A. (2018). *Harper's illustrated biochemistry* (31st ed.). McGraw-Hill Education.
- 6) Champe, P. C., & Harvey, R. A. (2018). *Lippincott's illustrated reviews: Biochemistry* (7th ed.). Wolters Kluwer.
- 7) Chatterjea, M. N., & Shinde, R. (2020). *Textbook of medical biochemistry* (9th ed.). Jaypee Brothers Medical Publishers.
- 8) Joshi, S. A. (2016). *Nutrition and dietetics* (5th ed.). McGraw-Hill Education.
- 9) Voet, D., Voet, J.G. (2012). *Fundamentals of Biochemistry*, John Wiley and Sons, New York.
- 10) Jain, J. L., Jain, S. and Jain. N. (2016). *Fundamentals of Biochemistry*, S. Chand & Company Ltd., New Delhi.

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SYLLABUS FOR THE

SUBJECT: CHEMISTRY

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Under NEP-2020

Semester VI

Session: 2025-26



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Bachelor of Science Home Science (Three Year Degree Programme)

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2025-26)

Bachelor of Science Home Science (Three Year Degree Programme) Semester-VI										
Course Code	Course Title	Course Type	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Marks				Examination time (in Hours)
						Total	Th	P	CA	
BHSM-6086	Applied Nutritional Biochemistry	C	3-0-2	3-0-1	4	100	60	20	20	3+3

Bachelor of Science Home Science (Three Year Degree Programme)

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Under NEP 2020)

(Session: 2025-26)

(Semester VI)

COURSE CODE: BSNL-6086

COURSE TITLE: Applied Nutritional Biochemistry

Course outcomes:

Students will be able to:

CO1: Explain the structure of amino acids and proteins, their metabolic pathways, and evaluate nitrogen balance and protein quality indicators.

CO2: Describe the concept of Basal Metabolic Rate (BMR), the factors influencing it, and the thermogenic effect of different nutrients.

CO3: Classify enzymes based on their function, explain their specificity, and analyze the factors that affect enzyme activity.

CO4: Interpret the normal and abnormal composition of urine and explain the mechanisms of water and electrolyte balance and the effects of dehydration.

Bachelor of Science Home Science (Three Year Degree Programme)

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Under NEP 2020)

(Session: 2025-26)

(Semester VI)

COURSE CODE: BSNL-6086

COURSE TITLE: Applied Nutritional Biochemistry

Exam Time: 3Hrs.

Max. Marks: 60

Credit (L-T-P): 3-0-0

Instructions for the Paper Setters: Eight questions of equal marks (twelve marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT I

Structural formulae of amino acids peptide bonds. Hydrolytic breakdown of protein & essential amino acids, Nitrogen balance, Protein efficiency ratio and biological value of protein. Elementary study of general metabolism of protein, building up of amino acid pool. General reaction of amino acid metabolism, Urea Cycle, Essential amino acids.

UNIT II

B.M.R. – Meaning and factors affecting B.M.R. specific dynamic action of good stuffs.

UNIT III

Enzymes – definition, classification and specificity of enzymes, Factors affecting enzyme activity.

UNIT IV

Urine composition, normal and abnormal constituents of urine, Water and electrolyte balance, water and electrolyte losses and their replenishment effect of dehydration.

Books Suggested

- 1) Nelson, D. L., & Cox, M. M. (2021). *Lehninger principles of biochemistry* (8th ed.). W.H. Freeman and Company.
- 2) Satyanarayana, U., & Chakrapani, U. (2021). *Biochemistry* (5th ed.). Elsevier India.
- 3) Vasudevan, D. M., Sreekumari, S., & Vaidyanathan, K. (2020). *Textbook of biochemistry for medical students* (9th ed.). Jaypee Brothers Medical Publishers.
- 4) Chatterjea, M. N., & Shinde, R. (2020). *Textbook of medical biochemistry* (9th ed.). Jaypee Brothers Medical Publishers.
- 5) Joshi, S. A. (2016). *Nutrition and dietetics* (5th ed.). McGraw-Hill Education.
- 6) Sharma, D. C. (2017). *Nutritional Biochemistry*, CBS Nursing Publishers.
- 7) Voet, D., Voet, J.G. (2012). *Fundamentals of Biochemistry*, John Wiley and Sons, New York.
- 8) Jain, J. L., Jain, S. and Jain. N. (2016). *Fundamentals of Biochemistry*, S. Chand & Company Ltd., New Delhi.

Bachelor of Science Home Science (Three Year Degree Programme)
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(Under NEP 2020)
(Session: 2025-26)
(Semester VI)
COURSE CODE: BSNL-6086(P)
COURSE TITLE: Applied Nutritional Biochemistry (Practical)

Course outcomes:

Students will be able to:

CO1: Perform qualitative tests to identify monosaccharides, disaccharides, and polysaccharides in various samples.

CO2: Estimate glucose concentration quantitatively using standard biochemical methods.

CO3: Analyze the presence of proteins, fats, and carbohydrates in common food items such as bread, milk, and eggs using biochemical tests.

CO4: Interpret experimental results and demonstrate basic proficiency in biochemical laboratory techniques related to food and biomolecule analysis.

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(Under NEP 2020)
(Session: 2025-26)
(Semester VI)
COURSE CODE: BSNL-6086(P)
COURSE TITLE: Applied Nutritional Biochemistry (Practical)

Exam Time: 3Hrs.

Max. Marks: 20

Credit (L-T-P): 0-0-1

1. Qualitative analysis of monosaccharide, disaccharide and polysaccharide.
2. Quantitative estimation of Glucose.
3. To test the reaction of protein fats and carbohydrate in bread, milk and egg.

Books Suggested

- 1) Oser, B. L. (2014). *Hawk's physiological chemistry* (14th ed.). Tata McGraw-Hill.
- 2) Plummer, D. T. (2017). *An introduction to practical biochemistry* (3rd ed.). McGraw-Hill Education.
- 3) Jayaraman, J. (1981). *Laboratory manual in biochemistry*. Wiley Eastern Ltd.
- 4) Sawhney, S. K., & Singh, R. (2019). *Introductory practical biochemistry* (2nd ed.). Narosa Publishing House.