



**Faculty of Nursing**  
**Basic B. Sc. Nursing – (B.Sc. Nursing)**  
**(W. E. F.: 2023-24)**  
Document ID: SUTEFNSB-01

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<b>Name of Faculty</b>	:	Faculty of Nursing
<b>Name of Program</b>	:	Post Basic B.Sc. Nursing
<b>Course Code</b>	:	1PBN03
<b>Course Title</b>	:	Biochemistry and Biophysics
<b>Type of Course</b>	:	PC
<b>Year of Introduction</b>	:	2023-24

<b>Pre requisite</b>	:	Basic knowledge of chemistry and Physics
<b>Course Objective</b>	:	This course introduces the basic principles of biochemistry and biophysics related to nursing
<b>Course Outcomes</b>	:	On completion of the course, the students will be able to
	CO1	Identify the basic principles of biochemistry and biophysics.
	CO2	Synthesize the knowledge of these principles in various nursing situations.

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Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	YEE	CIA	YEE	CIA	
2	0	0	2	75	25	0	0	100

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P – Practical, C – Credit, YEE – year End Examination, CIA – Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

<b>BIOCHEMISTRY</b>				
Unit No.	Topics	Teaching Hours	Weightage	Mapping With COs
I.	<ul style="list-style-type: none"> <li>Introduction : Importance of biochemistry in nursing</li> <li>Study of cell and its various components</li> </ul>	03	10%	CO1
II.	<ul style="list-style-type: none"> <li>Water and Electrolytes: Water-sources, property and functions in human body.</li> <li>Water and fluid balance.</li> <li>Electrolytes of human body, functions, sources.</li> </ul>	05	16.66%	CO1
III.	Enzymes <ul style="list-style-type: none"> <li>Mechanism of action</li> <li>Factors affecting enzyme activity</li> <li>Diagnostic applications</li> <li>Precautions for handling specimens for enzyme estimation</li> <li>Digestion and absorption of carbohydrates, proteins and fats</li> <li>Various factors influencing the digestion and absorption, mal-absorption syndrome</li> </ul>	07	23.33%	CO2
IV.	<ul style="list-style-type: none"> <li>Carbohydrates: Catabolism of carbohydrates for energy purposes</li> <li>Mitochondrial oxidation and oxidation phosphorylation.</li> <li>Fats of glucose in the body. Storage of glucose in the body, glycogenesis, glycogenolysis and neoglucogenesis, blood glucose and its regulation.</li> </ul>	5	16.66%	CO1



	<ul style="list-style-type: none"><li>Glucose tolerance test, hyperglycemia, hypoglycemia, glycemia.</li></ul>			
V.	<ul style="list-style-type: none"><li>Protein : Amino acids, hormones.</li><li>Essential amino acids. Biosynthesis of protein in the cells</li><li>Role of nucleic acid in protein synthesis.</li><li>Nitrogenous constituents of urine, blood, their origin –urea cycle, uric acid formation, gout. Plasma proteins and their functions.</li></ul>	5	16.66%	CO1
VI	<ul style="list-style-type: none"><li>Fat: Biosynthesis of fats and storage of fats in the body.</li><li>Role of liver in fat metabolism</li><li>Biological importance of important lipids and their functions</li><li>Cholesterol and lipoprotein</li><li>Sources, occurrence and distribution</li><li>Blood level and metabolism</li><li>Ketone bodies and utilization.</li><li>Inter- relationships in metabolism and cellular control of metabolic processes.</li></ul>	5	16.66%	CO2
<b>BIOPHYSICS</b>				
I	<ul style="list-style-type: none"><li>Introduction: Concepts of unit and measurements.</li><li>Fundamental and derived units.</li><li>Units of length, weight, mass, time.</li></ul>	2	6.66%	CO1
II	<ul style="list-style-type: none"><li>Vector and scalar motion, speed, velocity and acceleration</li></ul>	2	6.66%	CO1



III	<ul style="list-style-type: none"><li>• Gravity: Specific gravity, centre of gravity, principles of gravity.</li><li>• Effect of gravitational forces on human body.</li><li>• Application of principles of gravity in nursing.</li></ul>	3	10%	CO2
IV	<ul style="list-style-type: none"><li>• Force, work, Energy: Their units of measurement.</li><li>• Type and transformation of energy, forces of the body, static forces.</li><li>• Principles of machines, friction and bodymechanics.</li><li>• Simple mechanics – lever and body mechanics, pulley and traction, incline plane,screw.</li><li>• Application of these principles in nursing</li></ul>	3	10%	CO2
V	<ul style="list-style-type: none"><li>• Heat: Nature, measurement, transfer of heat</li><li>• Effects of heat on matter</li><li>• Relative humidity, specific heat</li><li>• Temperature scales</li><li>• Regulation of body temperature</li><li>• Use of heat for sterilization</li><li>• Application of these principles in nursing</li></ul>	3	10%	CO2
VI	<ul style="list-style-type: none"><li>• Light: Laws of reflection</li><li>• Focusing elements of the eye, defective vision and its correction, use of lenses.</li><li>• Relationship between energy, frequency and wavelength of light</li><li>• Biological effects of light.</li><li>• Use of light in therapy.</li></ul>	3	10%	CO2



	<ul style="list-style-type: none"><li>• Application of these principles in Nursing</li></ul>			
VII	<ul style="list-style-type: none"><li>• Pressures: Atmospheric pressure, hydrostatic pressure, osmotic pressure.</li><li>• Measurements of pressures in the body</li><li>• Arterial and venous blood pressures</li><li>• Ocular pressure</li><li>• Intracranial pressure</li><li>• Applications of these principles in nursing.</li></ul>	3	10%	CO2
VIII	<ul style="list-style-type: none"><li>• Sound: Frequency, Velocity and intensity</li><li>• Vocalization and hearing</li><li>• Use of ultrasound. Noise pollution and its prevention</li><li>• Application of these principles in nursing.</li></ul>	3	10%	CO2
IX	<ul style="list-style-type: none"><li>• Electricity and Electromagnetism: Nature of electricity. Voltage, current, resistance and their units.</li><li>• Flow of electricity in solids, electrolytes, gases and vacuum. Electricity and human body.</li><li>• ECG, EEG,EMG, ECT</li><li>• Pace makers and defibrillation.</li><li>• Magnetism and electricity.</li><li>• M.R.I Scanning, CAT Scan</li></ul>	3	10%	CO1
X	<ul style="list-style-type: none"><li>• Atomic Energy: Structure of Atom, Isotopes and Isobars.</li><li>• Radioactivity: Use of radioactive isotopes.</li><li>• Radiation protection units and limits, instruments used for detection of Ionizing radiation. X-rays.</li></ul>	3	10%	CO1

XI	<ul style="list-style-type: none"> <li>Principles of Electronics: Common electronic equipments used in patient care.</li> </ul>	2	6.66%	CO2
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Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	15	30	30	10	10	5

*NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.*

#### Reference Books

Sr.No.	Name of Reference Books
1	A textbook of Biochemistry for B.sc Nursing by Pankaja Naik,, Jaypee Publication 1 <sup>st</sup> edition, 2022
2	Essentials of Biochemistry for B.sc Nursing students by Harbans lal, CBS publishers and Distributors
3	Textbook of Biochemistry for Paramedical students by P. Ramamoorthy, 2 <sup>nd</sup> edition,2021, Jaypee Publication
4	Applied Biochemistry for B.sc Nursing by Manjula shantaram, Jaypee Publication 2 <sup>nd</sup> edition, 2022
5	Concise textbook of Biochemistry for Paramedical students by DM Vasudevan and Sukhes Mukherjee, 2 <sup>nd</sup> edition 2021, Jaypee Publication
6	A textbook of Biophysics, Nisha clement, Emmess, 2 <sup>nd</sup> edition
7	A textbook of physics, K Thayalan Jaypee, 1 <sup>st</sup> edition
8	A textbook of Biophysics in Nursing, Suresh K Sharma, Jaypee
9	A textbook of Physics practical , Dr Kusam Devgan, Dr Surinder Kaur, Peevee
10	A textbook of Physics, Dr V.K. Sewane,Pragati Prakashan