FACULTY OF NURSING

First Year Post Basic B.Sc. (Nursing)

In Effect from Academic Year 2021-2022

Subject Code: 1NR1020103	Subject Title: **Biochemistry & Biophysics**
Pre-requisite	**--------NA------**

Course Description

This course introduces the basic principles of biochemistry and biophysics related to nursing.

Teaching Scheme (Total Hours)			**Evaluation Scheme (Marks)**				
			Theory		**Practical**		
Lecture	**Practical**	**Total Hours**	**University Assessment**	**Continuous Assessment**	**University Assessment**	**Continuous Assessment**	**Total**
60	-	60	75	25	-	-	100

Course Content:

Section A: (Biochemistry)

THEORY: -30 Hrs

UNIT NO	HOURS	Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
I	4Hrs	Describe basic principles of biochemistry Describe the structure & functions of cell	**Introduction :** Importance of biochemistry in nursing * Study of cell and its various components.	Lecture, discussion, charts,slides Demonstration use of microscope	Written Test; Objective and Essay Type.
II	4Hrs	Describe the water & electrolyte balance of human body	**Water and Electrolytes:** Water sources, property and functions in human body. * Water and fluid balance. * Electrolytes of human body, functions, sources.	Lecture, discussion, Charts Slides Explain using charts, graph	Written Test; Objective and Essay Type.
III	5Hrs	Explain the mechanism of enzymes	**Enzymes** * Mechanism of action * Factors affecting enzyme activity * Diagnostic applications * Precautions for handling specimens for enzyme estimation * Digestion and absorption of carbohydrates, proteins and fats * Various factors influencing the digestion and absorption, malabsorption syndrome	Lecture, discussion Slides Demonstration in laboratory	Written Test; Objective and Essay Type.
IV	6Hrs	Explain catabolism of carbohydrates Explain the storage and utilization of fats & glucose in the body	**Carbohydrates:** Catabolism of carbohydrates forenergy purposes * Mitrochondrial oxidation and oxidation phosphorylation. * Fats of glucose in the body. Storage of glucose in the body, glycogenesis, glycogenolysis and neoglucogenesis, blood glucoseand its regulation. * Glucose tolerance test, hyperglycemia, hypoglycemia, glycemia.	Lecture, discussion Charts Slides Demonstration of laboratory tests	Written Test; Objective and Essay Type.

V	5Hrs	Explain the metabolism of amino acids & proteins	**Protein :** Amino acids, hormones. * Essential amino acids. Biosynthesis of protein in the cells * Role of nucleic acid in protein synthesis. * Nitrogenous constituents of urine, blood, their origin –urea cycle, uric acid formation, gout. * Plasma proteins and their functions.	Lecture, discussion Charts Slides Demonstration of laboratory tests	Written Test; Objective and Essay Type.
VI	6Hrs	Explain the metabolism of fat, importace lipids & their functions	**Fat:** Biosynthesis of fats and storage of fats in the body. * Role of liver in fat metabolishm * Biological importance of important lipids and their functions * Cholesterol and lipoprotein * Sources, occurrence and distribution * Blood level and metabolism * Ketone bodies and utilization. * Inter- relationships in metabolism and cellular control of metabolic processes.	Lecture, discussion, explain using charts, graph	Written Test; Objective and Essay Type.

Section B: (Biophysics) **THEORY: -30 Hrs**

UNIT NO	HOURS	Learning Objective	COURSE CONTENTS	Teaching learning Activities	Assessment Method
I	2Hrs	Basic principles of biophysics	Introduction: Concepts of unitand measurements. * Fundamental and derivedunits. * Units of length, weight, mass, time.	Lecture, discussion ,chart slides	Written Test; Objective and Essay Type.
II	2Hrs	Describe the vector & scalar motion	Vector and scalar motion, speed, velocity and acceleration.	Lecture, & discussio n	Written Test; Objective and Essay Type.
III	3Hrs	Describe the gravity & v its application in nursing	Gravity: Specific gravity, centre of gravity, principles ofgravity. * Effect of gravitational forceson human body. * Application of principles ofgravity in nursing	Lecture, discussion, chart slides experiments	Written Test; Objective and Essay Type.
IV	3Hrs	& energy ,its principle & application in nursing	* Type and transformation ofenergy, forces of the body, static forces. * Principles of machines, friction and body mechanics. * Simple mechanics – leverand body mechanics, pulleyand traction, incline plane, screw. * Application of theseprinciples in nursing.	charts, slides experiments	Essay Type.
V	3Hrs	Describe the heat ,its	Heat: Nature, measurement,transfer of heat	Lecture, discussion	Written Test; Objective and

		primciple& application in nursing	* Effects of heat on matter * Relative humidity, specificheat * Temperature scales * Regulation of bodytemperature * Use of heat for sterilization * Application of these principles in nursing	Demonstration	Essay Type.
VI	3Hrs	Describe the light ,its principle & applications in nursing	Light: Laws of reflection * Focusing elements of the eye, defective vision and its correction, use of lenses. * Relationship between energy, frequency and wavelength of light * Biological effects of light. * Use of light in therapy. * Application of these principles in Nursing.	Lecture, discussion Demonstration, carts slides	Written Test; Objective and Essay Type.
VII	3Hrs	Describe the pressure ,its principle & applications in nursing	Pressures: Atmospheric pressure, hydrostatic pressure, osmotic pressure. Measurements of pressures in the body * Arterial and venous blood pressures * Ocular pressure * Intracranial pressure * Applications of theseprinciples in nursing.	Lecture, discussion demonstration charts ,slides	Written Test; Objective and Essay Type.
VIII	2Hrs	Describe the sound ,its principle & applications in nursing	Sound: Frequency, Velocityand intensity * Vocalization and hearing * Use of ultrasound. Noise pollution and its prevention * Application of theseprinciples in nursing.	Lecture, discussio n	Written Test; Objective and Essay Type.
IX	5Hrs	Describe the electricity & applications in human body	Electricity and Electromagnetism: Nature ofelectricity. Voltage, current, resistance and their units. * Flow of electricity in solids, electrolytes, gases and vacuum. * Electricity and human body. * ECG, EEG, EMG, ECT * Pace makers and defibrillation * Magnetism and electricity. * M.R.I Scanning, CAT Scan	Lecture, discussion, demonstration Supervised clinical practice	Written Test; Objective and Essay Type.
X	2Hrs	Describe the atomic energy. its structure, use & applications in nursing	Atomic Energy: Structure ofAtom, Isotopes and Isobars. * Radioactivity: Use ofradioactive isotopes. * Radiation protection units and limits, instruments used for detection of lionizing radiation. X-rays.	Lecture, discussio ncharts	Written Test; Objective and Essay Type.

XI	2Hrs	Describe the principle of electronic & its applications in nursing	Principles of Electronics: Common electronic equipments used in patientcare.	Lecture, discussion Supervise dclinical practice	Written Test; Objective and Essay Type

Practicum:
Experiments and Tests should be demonstrated wherever applicable.