VIDYASAGAR UNIVERSITY

Midnapore, West Bengal

PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE WITH PHYSIOLOGY

(MULTIDISCIPLINARY STUDIES)

3-YEAR UNDERGRADUATE PROGRAMME

(w.e.f. Academic Year 2023-2024)

Based on

Curriculum & Credit Framework for Undergraduate Programmes

(CCFUP), 2023 & NEP, 2020

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VIDYASAGAR UNIVERSITY

BACHELOR OF SCIENCE IN LIFE SCIENCES with PHYSIOLOGY

(*under CCFUP, 2023*)

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
								CA	ESE	TOTAL
B.Sc. in Life Sc. with Physiology	1st	I	**SEMESTER-I**							
			Major (Disc.-A1)	PHYPMJ101	T: Fundamentals of body fluids, Immunity, Circulation and Respiration P: Hematology and Human Experiment *(To be studied by the students taken Physiology as Discipline-A)*	4	3-0-1	15	60	75
			SEC	SEC01	*To be chosen from SEC-01 of Discipline A/B/C of their Hons. prog.*	3	0-0-3	10	40	50
			AEC	AEC01	Communicative English-1 (*common for all programmes*)	2	2-0-0	10	40	50
			MDC	MDC01	Multidisciplinary Course-1 (*to be chosen from the list*)	3	3-0-0	10	40	50
			VAC	VAC01	VAC-01: ENVS (*common for all programmes*)	4	2-0-2	50	50	100
			Minor (Disc.-C1)	PHY MI 01/C1	T: Introduction to Physiology-I; P: Practical *(To be studied by the students taken Physiology as Discipline-C)*	4	3-0-1	15	60	75
					Semester-I Total	20				400
		II	**SEMESTER-II**							
			Major (Disc.-B1)		*To be decided* *(Same as like A1 for students taken Physiology as Discipline-B)*	4	3-0-1	15	60	75
			SEC	SEC02	*To be chosen from SEC-02 of Discipline A/B/C of their Hons. prog.*	3	0-0-3	10	40	50
			AEC	AEC02	MIL-1 (*common for all programmes*)	2	2-0-0	10	40	50
			MDC	MDC02	Multi Disciplinary Course-02 (*to be chosen from the list*)	3	3-0-0	10	40	50
			VAC	VAC02	VAC-02 (*to be chosen from the list*)	4	4-0-0	10	40	50
			Minor (Disc.-C2)	PHY MI 02/C2	T: Introduction to Physiology-II; P: Practical *(To be studied by the students taken Physiology as Discipline-C)*	4	3-0-1	15	60	75
			Summer Intern.	CS	Community Service	4	0-0-4	-	-	50
					Semester-II Total	24				400
					TOTAL of YEAR-1	44	-	-	-	800

P MJ= Major Programme (Multidisciplinary), MI = Minor, A/B = Choice of Major Discipline; C= Choice of Minor Discipline; SEC = Skill Enhancement Course, AEC = Ability Enhancement Course, MDC = Multidisciplinary Course, VAC = Value Added Course; CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical, MIL = Modern Indian Language, ENVS = Environmental Studies

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MAJOR (MJ)

MJ A1/B1: Fundamentals of body fluids, Immunity, Circulation and Respiration Credits 04 (FM: 75)

MJ A1/B1T: Fundamentals of body fluids, Immunity, Circulation and Respiration Credits 03 [45L]

Course contents:

Unit-I Blood, body fluid and immune System:

Blood, body fluid: Basic idea of intracellular and extracellular compartments of body fluid. Water: intake and excretion. Volumes of body water in different compartments and their estimation. Water balance and its regulation. Dehydration and edema. Composition, properties and functions of blood, blood cell formation and related disorders, Blood groups, Blood transfusion and its hazards, Blood clotting (types), anti-clotting mechanism and blood disorders; Blood volume: Normal value, Determination of blood volume, variation and maintenance of blood volume. Effective blood volume, factors influencing blood volume, regulation ofblood volume; Erythropoiesis: Definition, steps of erythropoiesis, role of different factors on erythropoiesis; Platelets: Structure, functions. Platelet's reaction, Critical counts of Platelets. Significance of platelets counts. Haemoglobin: Structure, properties and functions of haemoglobin. Abnormal haemoglobin. Bone marrow: synthesis, functions. Blood grouping: The ABO systems, The Rhsystems, The MN system.

Fundamental concept of Immune System: Overview of Immune System - properties of immune system; types of immunity: innate immunity, acquired immunity, active and passive immunity. First and second line defence. Immuno-competent Cells- Structure and functions of Neutrophil, B-lymphocytes, Tlymphocytes (helper, cytotoxic and suppressor), Natural Killer (NK) cells, monocytes macrophages. Primary and secondary lymphoid organs. Antigen-Antibody: Properties of immunogen, antigens and haptens. Classification, structure and functions of immunoglobulins (IgG, IgM, IgA, IgD, IgE). Acquired Immunodeficiency: AIDS, The HIV virus & infection; immunological events associated with HIV infection. Immunization: Concept about immunization, Immunizing agent- vaccine, antisera, DNA vaccine, edible vaccine. Immunization schedules - National and WHO.

Unit-II: Cardiovascular System: Anatomy and histology of the heart. Properties of cardiac muscle. Origin and propagation of cardiac impulse. Properties of cardiac muscle, origin & propagation of cardiac impulse. Structure of arteries, arterioles, capillaries. Venules and veins. Heart Block, basic idea about artificial pacemaker. Cardiac valves, Heart rate and its regulations. Heart sounds. Nerves and its role in the regulation of the heart function. Frank–Starlings laws of heart. Blood Pressure- Definition, Factors affecting blood pressure; Regulation: Chemical and Neural; Cardiac output – factor affecting; Heart rate- regulation, bradicardia, tachycardia; Types of blood pressure: Hypertension and hypotension; Cardiac cycle: Events of cardiac cycle, Heart rate, Heart Sound, Heart rate control, factors affecting and regulation. Cardiac output: methods of determination (dye dilution and Fick principle), factors affecting regulation. Role of Renin- angiotensin system, Vasopressin or ADH in Blood Pressure regulations.

Unit III: Physiology of Respiratory system: Introduction, anatomical structure and functions of the lungs. Basic concepts about respiratory tract, histology of lungs, respiratory muscles and their innervations. Mechanism of respiration; Regulation of respiration; Mechanics of breathing. Role of respiratory centres, central and peripheral chemoreceptors. Gas (CO_2 and O_2) transport mechanism in the lungs; CO_2 and O_2dissociation curve, factors affecting, clinical application; Respiratory acidosis and alkalosis; non-respiratory functions of lungs. Compliance, elasticity and elastic recoil of the lung. Role of lung surfactants. Lung compliance; Artificial respiration. Respiratory failure. High altitude sickness. Different lung volume and capacities; Lung Function Tests. Hypoxia: Types and causative factors; Oxygen treatment, O_2toxicity; Asphyxia: definition, cause, sign and symptoms.

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MI – 1P: Hematology and Human Experiment (Practical) **Credits 01**

Course Outlines

Hematology:

a) Preparationofbloodfilmofyourownblood.StainingofthebloodfilmwithLeishman'sstain.
b) Identification of different types of blood corpuscles.
c) Determination of TC of RBC and WBC by haemocytometer.
d) Differential count of WBC.
e) Determination of ESR of human blood.
f) Estimation of haemoglobin by haemoglobinometer.
g) Preparation of haemincrystals.
h) Determination of Blood groups.
i) Determination of clotting time, bleeding time, prothrombin time.

Human Experiment:

a) Measurement of arterial blood pressure by Sphygmomanometer test, Calculate the mean arterial blood pressure (MABP).
b) Measurement of heart rate and pulse rate (30 beats methods) during rest condition.
c) Study of blood pressure with the changes of postures (Standing, Supine, Sitting).
d) Study of pulse rate as an effect of breath-holding.
e) Study of pulse rate with the variation of static work load.
f) Determination of Physical Fitness Index (PFI) of an Individual by Modified Harvard Step test.

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MINOR (MI)

MI-1/C1: Same as Minor-1 (PHYMI01) of Physiology (Hons) programme — **Credits 04**, **Full Marks: 75**

MI-2/C2: Same as Minor-2 (PHYMI02) of Physiology (Hons) programme — **Credits 04**, **Full Marks: 75**

SKILL ENHANCEMENT COURSE (SEC)

TO BE CHOSEN FROM THE BUCKET OF SECs OF SELECTED DISCIPLINE A/B/C
(As per A/B/C Hons. Prog. Syllabus)

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