DEBRA THANA S.K.S. MAHAVIDYALAYA
(AUTONOMUS)

Chakshyampur, Debra, Paschim Medinipur, West Bengal

PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE (HONOURS)

MAJOR IN PHYSIOLOGY

4-YEAR UNDERGRADUATE PROGRAMME

(w.e.f. Academic Year 2024-2025)

Based on

Curriculum & Credit Framework for Undergraduate Programmes (CCFUP), 2023 & NEP, 2020

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(AUTONOMUS)
BACHELOR OF SCIENCE (HONOURS) MAJOR IN PHYSIOLOGY
(under CCFUP, 2023)

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
								CA	ESE	TOTAL
B.Sc. (Hons.)	2nd	III			**SEMESTER-III**					
			Major-3	PHYHMJ03	**T: Nutritional energy and metabolism; P: Biochemistry (Practical)**	4	3-0-1	15	60	75
			Major-4	PHYHMJ04	**T: Cardio-respiratory & Excretory Physiology; P: Biochemical and Human Experiments (Practical)**	4	3-0-1	15	60	75
			SEC	PHYSEC03	**P: Occupational Health (Practical)**	3	0-0-3	10	40	50
			AEC	AEC03	Communicative English -2 (***common for all programmes***)	2	2-0-0	10	40	50
			MDC	MDC03	Multidisciplinary Course -3 (***to be chosen from the list***)	3	3-0-0	10	40	50
			Minor-3 (Disc.-I)	PHYMIN03	**T: Endocrinology, Reproductive Physiology; P: Practical**	4	3-0-1	15	60	75
					Semester-III Total	20				375
		IV			**SEMESTER-II**					
			Major-5	PHYHMJ05	**T: Endocrine system and Cell-Cell communication with signaling; P: Histological Staining (Practical)**	4	3-0-1	15	60	75
			Major-6	PHYHMJ06	**T: Reproductive System & Embryology; P: Experiments on Bio-Chemical Techniques & Embryology**	4	3-0-1	15	60	75
			Major-7	PHYHMJ07	**T: Neuromuscular Physiology; P: Experiment on Nerve-muscle Physiology (Practical)**	4	3-0-1	15	60	75
			AEC	AEC04	MIL-2 (***common for all programmes***)	2	2-0-0	10	40	50
			Minor-4 (Disc.-II)	PHYMNI04	**T: Neuromuscular Physiology; P: Practical**	4	3-0-1	15	60	75
			Summer Intern.	INT	**Internship/ Apprenticeship - activities to be decided by the Colleges following the guidelines to be given later**	4	0-0-4	-	-	50
					Semester-IV Total	24				400
					TOTAL of YEAR-2	44				775

MJ = Major, MI = Minor Course, SEC = Skill Enhancement Course, AEC = Ability Enhancement Course, MDC = Multidisciplinary Course, CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical, MIL = Modern Indian Language

MINOR (MI)

(Total Credit – 04 (Theory - 03, Practical - 01); Total marks: 75

Minor (MI) 3: Theory (Discipline-I)

Minor-MI-03/C3T: Endocrinology, Reproductive Physiology (Theory): Credits 03

❖ **Endocrinology:**

Concept & definition of endocrine systems, glands, and hormones. General classification of hormones on a chemical basis. **Hypothalamo-hypophysial axis:** Positive and negative Feedback regulation; **Hypothalamus and Pituitary:** Hypothalamus as a neuroendocrine organ, Releasing Factors, Tropic hormones of hypothalamus. **Hormones:** Chemistry, modes of action, and functions of growth hormone (GH), TSH, ACTH, FSH, LH, Prolactin, MSH, Vasopressin, and Oxytocin. Endocrine gland: Pancreas, Adrenal, Thyroid structure, functions, and deficiencies.

❖ **Reproductive Physiology:**

Primary and secondary sex organs: Physiology and anatomy, secondary sex characters. Puberty and its control. **Testis:** Histological structure of testis, seminiferous tubules, and interstitial cells of Leydig. **Spermatogenesis:** Mechanism of spermatogenesis, Spermiogenesis and hormonal control of testicular function. Prostate and seminal vesicle. **Ovary:** Histological structure of ovary, Graafian follicle, and Corpus luteum, chemical nature and functions of Estrogen and Progesterone. **Menstrual cycles**: Basic concept of menstruation and its hormonal control. **Pregnancy:** Physiology of pregnancy, changes during pregnancy and their hormonal control; Pregnancy tests (Immunological); Ectopic pregnancy. **Placenta:** Formation, structure, functions, and fate of the placenta. Placental hormones. **Lactation and Mammary Gland:** Anatomical and histological structure of mammary gland. Phases of mammary development, lactation, and their hormonal control. **Contraceptive:** Definition, types, and use of contraceptives.

Minor (MI)-03/C3P: Practical Credits 01

- **Pregnancy test by strip method.**
- **Histological slide identification:**- Adrenal gland, thyroid gland, pancreas, Testis, ovary, Pituitary and Kidney.
- **Preparation and staining of permanent slide (Ovary, Testes).**
- **Oestrus cycle.**

Minor (MI) 4: Theory (Discipline-II)

Minor (MI)-04/C4T: Neuromuscular Physiology (Theory): **Credits 03 [45L]**

❖ **Nerve-Muscle Physiology:**

Muscle Structure and Functions: Histo-anatomical structures of striated, smooth, and cardiac muscles. **Properties of muscles:** Excitability and contractility, all or none law, summation of stimuli and contractions, genesis of tetanus, the onset of fatigue, refractory period, tonicity, conductivity, extensibility, and elasticity. Muscle proteins and Sarcotubular system of Human Skeletal and Cardiac Muscle. **Mechanism of muscle contraction:** Skeletal muscle contraction and relaxation. The modern concept of muscle contraction. Isometric and isotonic contractions. Red and white muscles. Fast and slow twitch muscle fibers. Muscle length, Tension, and Velocity relationships of skeletal muscle. **Muscle groups:** antagonists and agonists. Motor unit and motor point.

Structure, properties, and Function of Neuromuscular junctions: EM structure of Neuromuscular junctions, Neuro-Muscular transmission of impulse, end-plate potential (EPP), miniature end-plate potential (MEPP). Electromyography. The resting membrane potential and its origin. **The Action Potential:** Action potential components and their ionic basis. Compound action potentials. Concept of Chronaxie and Rheobase. Saltatory conduction. Myelinated and Unmyelinated nerve fibers and process of Myelinogenesis. **Nerve Impulse & its Conduction:** Propagation of nerve impulse in different nerve fibers. Conduction velocity of nerve impulse concerning myelination and diameter of nerve fibers & its significance. **Properties of nerve fibers:** Excitability, Conductivity, All-or-none law, Accommodation, Adaptation, Summation, Refractory period, Indefatigability. **Synapses:** Types, EM Structure and Functions. Mechanism of Synaptic Transmission, Neurotransmission related Synaptic Potentials (EPSP, IPSP). Structure and distribution of acetylcholine and adrenaline receptors**.** Effect of different Neurotrophins on nerve growth.

Minor (MI)-04/ C4P: Practical **Credits 01**

- **Histological slide identification:**- Cerebral cortex, cerebellum, spinal cord,
- **Preparation and staining of skeletal muscle by methylene blue.**
- **Staining of Node of Ranvier.**
- **Reflex analysis:** Examination of planter reflex, knee jerk reflex.
- **Calculation and Interpretation of simple muscle twitch and effect of temperature, load and summation on supplied kymographic recording.**