WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION

SYLLABUS FOR CLASS XI

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

CLASS - XI

SEMESTER – I

FULL MARKS : 35 **CONTACT HOURS : 55 Hours**

COURSE CODE: THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT I (DIVERSITY OF LIVING ORGANISM)	Chapter-1: The Living World Biodiversity; need for classification; three domains of life; Taxonomy and Systematics; concept of species; and taxonomical hierarchy; binomial nomenclature; Tools for study of Biodiversity; Museums; Zoological and Botanical Gardens; Herbaria (Definition: World's largest herbarium, name of the herbarium in Bengal, Importance of herbarium)	2	19
	Chapter-2: Biological Classification Five Kingdoms of Classification; Salient features and classification of Monera; Protista and Fungi into major groups; Lichens, Viruses, Viroids and Prions.	5	
	Chapter-3: Plant Kingdom Classification of Plants into major Groups, Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnosperm.	5	
	Chapter-4: Animal Kingdom Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level.	7	
UNIT II STRUCTURAL ORGANIZATIONS IN PLANTS AND ANIMALS)	Chapter-5: Morphology of Flowering Plants Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit, and seed. Description of families : Malvaceae, Solanaceae, Brassicaceae, Compositae, Leguminosae (Dicots), Poaceae, Liliaceae (Monocots).	8	16
	Chapter-6: Anatomy of Flowering Plants Plant tissue systems including Mechanical tissue systems, anatomy and functions of tissue systems in dicots and monocots.	4	
	Chapter-7: Structural Organization in Animals Animal Tissue Systems: epithelial, connective, muscular and nervous systems (structure, organization and function); morphology, anatomy and functions of different systems; digestive, circulatory, respiratory, nervous, and reproductive systems of frog.	4	

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT III (CELL STRUCTURE AND FUNCTIONS)	Chapter-8: Cell- The Unit of Life Cell theory and cell as the basic unit of life; structure of prokaryotic and eukaryotic cells; Plant cell and Animal cell; cell envelope; cell membrane, cell wall; cell organelles — structure and function; endo-membrane system, nucleus, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies, cytoskeleton, cilia, flagella, centrioles (ultra-structure and function).	7	20
	Chapter-9: Biomolecules Chemical constituents of living cells: biomolecules; structure and function of proteins; carbohydrates; lipids; and nucleic acids; Enzyme — types; properties; enzyme action.	9	
	Chapter-10: Cell Cycle and Cell Division Cell cycle; mitosis; meiosis; and their significance.	4	

CLASS - XI

SEMESTER – II

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

FULL MARKS : 35 **CONTACT HOURS : 97 HOURS**

COURSE CODE : THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT IV (PLANT PHYSIOLOGY)	Chapter-11: Photosynthesis in Higher Plants Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (structure of chlorophyll; empirical formula of chlorophyll a, b, c, d, e, bacteriochlorophyll, carotene and xanthophyll); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis, photorespiration, C3 and C4 pathways, CAM Cycle (schematic pathway only), factors affecting photosynthesis.	14	34
	Chapter-12: Respiration in Plants Exchange of gases; cellular respiration — glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations — number of ATP molecules generated; amphibolic pathways; respiratory quotient.	14	
	Chapter-13: Plant Growth and Development Seed germination; phases of plant growth and plant growth rate; conditions of growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; plant growth regulators — auxin, gibberellin, cytokinin, ethylene, ABA, Photoperiodism — Definition and different types.	6	

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT V (HUMAN PHYSIOLOGY)	Chapter – 14: Digestion and Absorption Introduction; Structure of human alimentary canal (drawing, labelling and function of different parts including dental arrangement and digestive glands); Role of digestive enzymes and the GI hormone in digestion; Peristalsis; Digestion, absorption and assimilation of protein, carbohydrate and fat; egestion; Nutritional and digestive disorders — PEM (protein energy malnutrition) indigestion, constipation, vomiting, jaundice, diarrhoea.	9	63
	Chapter-15: Breathing and Exchange of Gases Respiratory organs in animals (name only); Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration — asthma, emphysema, occupational respiratory disorders.	9	
	Chapter-16: Body Fluids and Circulation Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system — hypertension, coronary artery disease, angina pectoris, heart failure.	9	
	Chapter-17: Excretory Products and their Elimination Modes of excretion — ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; counter-current mechanism; regulation of kidney function — renin-angiotensin system, atrialnatriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders — uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.	7	
	Chapter-18: Locomotion and Movement Types of movement - ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.	8	
	Chapter-19: Neural Control and Coordination Mechanism of neural control and co-ordination; Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; Brain and its major parts- cerebral cortex, thalamus, hypothalamus and limbic system; mid-brain, pons, medulla, cerebellum and spinal cord (function only); Modes of distribution and function of P.N.S. and autonomic nervous system; Generation and conduction of nerve impulse; reflex action and reflex arc; Sense organs – Sensory perception, outline structure and function of eye and ear; Disorders — Parkinson's and Alzheimer's diseases.	12	
	Chapter-20: Chemical Coordination and Integration Endocrine glands and hormones; human endocrine system — hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (protein and steroid hormones); role of hormones as messengers and regulators, hypo- and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goitre, exophthalmic goitre, diabetes, Addison's disease.	9	

CLASS: XI

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

COURSE CODE : PRACTICAL

FULL MARKS : 30 **CONTACT HOURS: 30 HOURS**

Time allowed : 3 hours. **Max. Marks : 30**

EVALUATION SCHEME	MARKS
One major experiment Part A.(experiment no-1,3,7)	6
One minor experiment Part A.(experiment no-6,8,9,10,11)	5
Slide preparation Part A.(experiment no-2,4,5) (any one)	3
Spotting. Part – B (three)	6(2x3)
Practical record+Viva voce	5(3+2)
Investigatory project viva voce	5(3+2)
Total: SEM-I = 14 PRACTICAL CLASSES + SEM-II = 22 PRACTICAL CLASSES (24HRS.)	30

A. List of Experiments

1. Study and describe locally available common flowering plants from family Malvaceae, Solanaceae,Brassicaceae, Asteraceae,Leguminosae including dissection and display of floral whorls,Anther and Ovary to show number of chambers(Placentation).(Floral formula and floral diagrams.),Type of root.(Tap and adventitious.);Type of stem.(Herbaceous and woody); Leaf (Arrangement,shape,venation,simple and compound)
2. Preparation and study of TS of dicot and monocot roots and stems.(Primary.)
3. Study of osmosis by Potato Osmometer.
4. Study of plasmolysis in epidermal peels (e.g..Rheo/lily or fleshy scale leaves of onion bulb)
5. Study of distribution of stomata on the upper and lower surfaces of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surfaces of leaves.
7. Test for the presence of sugar. starch, proteins and fats in suitable plant and animal materials.
8. Test for presence of urea in urine.
9. Test for presence of sugar in urine.
10. Test for presence of Albumin in urine.
11. Test for presence of Bile salts in urine.

B. Study and observe the following (Spotting)

1. Parts of a compound microscope.
2. Specimens./Slides./Models. Identify with reasons.—Bacteria, Spirogyra,Rhizopus,mushroom,yeast,liverwort, moss, fern,pine cone: male and female,one monocotyledonous plant, one dicotyledonous plant, one lichen.Different types of inflorescence.(Racemose and Cymose)
3. Virtual specimens/Slides/Models. Identifying features of Amoeba, Hydra, Liver Fluke, Ascaris, Leech, Earthworm, Prawn, Silkworm, Honeybee, Snail, Starfish, Shark, Rohu, Frog, Lizard, Pigeon and Rabbit. Human blood, and Toad blood
4. Mitosis in onion root tip cells and animal cells (Grasshopper) from permanent slides.
5. Human skeleton and different types of joints with the help of Virtual image/Models only.

[Note:*18 **Hours** reserved for Remedial classes, Tutorials and Home Assignments.]