NOTICE

Date: 06-July-2021

It is here by informed to all the students that commencement of second, fourth and sixth semester class will be on 6th July 2021. The teachers have assigned paper as per following. Each assign teachers will take internal examination. Inter will taken on practical as well as on theory. The class will be follow following routine. Students are requested to cooperate with faculties and beware about internal examinations.

HOD
Department of Zoology
Rabindra Mahavidyalaya

Theory Paper Allotment

Semestar	Batch	Paper	Subject	Abbreviated Name	Allotted Teacher	Contact Number
Sem I	HONS	CC-1	**Non-Chordates I**	E.M	Eureka Mondal	8250656417, 9476440223
				P.P	Piyali Pakhira	8961185116, 7718534071
				S.N.D	Sudha Anjella Dhan	8874744784, 8910634099
		CC-2	**Ecology**	P.K.M	Palas Kanti Manna	9732381772, 9382113782
				B.S	Dr. Baisakhi Saha	9433315086, 7003580734
				S.R.D	Souren Dutta	7031282464, 9475671886
	GEN	GE/CC-1	**Animal Diversity**	S.R.D	Souren Dutta	7031282464, 9475671886
				E.M	Eureka Mondal	8250656417, 9476440223
SEM III	HONS	CC-5	**Chordates**	B.S	Dr. Baisakhi Saha	9433315086, 7003580734
				P.P	Piyali Pakhira	8961185116, 7718534071
		CC-6	**Animal Physiology: Controlling &Coordinating Systems**	E.M	Eureka Mondal	8250656417, 9476440223
				S.N.D	Sudha Anjella Dhan	8874744784, 8910634099
		CC-7	**Fundamentals of Biochemistry**	S.R.D	Souren Dutta	7031282464, 9475671886
				P.K.M	Palas Kanti Manna	9732381772, 9382113782
		SEC-1	**Apiculture or Sericulture**	E.M	Eureka Mondal	8250656417, 9476440223
				P.K.M	Palas Kanti Manna	9732381772, 9382113782
				S.N.D	Sudha Anjella Dhan	8874744784, 8910634099
	GEN	GE/CC-3	**Physiology and Biochemistry**	S.R.D	Souren Dutta	7031282464, 9475671886
				E.M	Eureka Mondal	8250656417, 9476440223
				P.P	Piyali Pakhira	8961185116, 7718534071
Sem V	HONS	CC-11	**Molecular Biology**	S.R.D	Souren Dutta	7031282464, 9475671886
				P.K.M	Palas Kanti Manna	9732381772, 9382113782
		CC-12	**Genetics**	P.P	Piyali Pakhira	8961185116, 7718534071
				S.N.D	Sudha Anjella Dhan	8874744784, 8910634099
		DSC-1 & 2	**Animal Biotechnology or Microbiology**	P.K.M	Palas Kanti Manna	9732381772, 9382113782
				B.S	Dr. Baisakhi Saha	9433315086, 7003580734
		DSC-3 & 4	**Biology of Insects** or **Parasitology**	P.P	Piyali Pakhira	8961185116, 7718534071
				E.M	Eureka Mondal	8250656417, 9476440223
	GEN	DSC-1	**Aquatic Biology or Applied Zoology**	S.R.D	Souren Dutta	7031282464, 9475671886
				E.M	Eureka Mondal	8250656417, 9476440223
		SEC-3	**Sericulture**	P.P	Piyali Pakhira	8961185116, 7718534071
				E.M	Eureka Mondal	8250656417, 9476440223
				S.N.D	Sudha Anjella Dhan	8874744784, 8910634099

Practical Paper Allotment

Semestar	Batch	Paper	Subject	Allotted Teacher	Contact Number
Sem I	HONS	CC-1	**Non-Chordates I**	Eureka Mondal	8250656417, 9476440223
				Piyali Pakhira	8961185116, 7718534071
				Sudha Anjella Dhan	8874744784, 8910634099
		CC-2	**Ecology**	Palas Kanti Manna	9732381772, 9382113782
				Dr. Baisakhi Saha	9433315086, 7003580734
				Souren Dutta	7031282464, 9475671886
	GEN	GE/CC-1	**Animal Diversity**	Piyali Pakhira	8961185116, 7718534071
SEM III	HONS	CC-5	**Chordates**	Piyali Pakhira	8961185116, 7718534071
				Dr. Baisakhi Saha	9433315086, 7003580734
		CC-6	**Animal Physiology: Controlling & Coordinating Systems**	Eureka Mondal	8250656417, 9476440223
				Sudha Anjella Dhan	8874744784, 8910634099
				***(PP & BS & SRD & PKM Assist for microtomy)**	
		CC-7	**Fundamentals of Biochemistry**	Palas Kanti Manna	9732381772, 9382113782
				Souren Dutta	7031282464, 9475671886
	GEN	GE/CC-3	**Physiology and Biochemistry**	Eureka Mondal	8250656417, 9476440223
				Piyali Pakhira	8961185116, 7718534071
				Souren Dutta	7031282464, 9475671886
Sem V	HONS	CC-11	**Molecular Biology**	Palas Kanti Manna	9732381772, 9382113782
				Souren Dutta	7031282464, 9475671886
				Dr. Baisakhi Saha	9433315086, 7003580734
		CC-12	**Genetics**	Piyali Pakhira	8961185116, 7718534071
				Sudha Anjella Dhan	8874744784, 8910634099
		DSC-1	**Animal Biotechnology or Microbiology**	Dr. Baisakhi Saha	9433315086, 7003580734
		DSC-2	**Aquatic Biology or Applied Zoology**	Eureka Mondal	8250656417, 9476440223
	GEN	DSC-3	**Aquatic Biology or Applied Zoology**	Piyali Pakhira	8961185116, 7718534071

Sem – I

CC-1 (Theory)

Sem	Paper	Subject Topic	Asign Teacher
I (Hons)	CC1 **Non-Chordates I**	**Basics of Animal** Classification Definitions: Classification, Systematics and Taxonomy; Taxonomic Hierarchy, Taxonomic types. Codes of Zoological Nomenclature; Principle of priority; Synonymy and Homonymy; Five kingdom concept of classification (Whittaker)	SND
		Protista and Metazoa Protozoa General characteristics and Classification up to phylum (according to Levine *et. al.*, 1980) Locomotion in *Euglena*, *Paramoecium and Amoeba*; Conjugation in *Paramoecium*. Life cycle and pathogenicity of *Plasmodium vivax and Entamoeba histolytica* Metazoa Evolution of symmetry and segmentation of Metazoa	EM
		Porifera General characteristics and Classification up to orders (after Hyman, 1951); Canal system and spicules in sponges	EM
		Cnidaria General characteristics and Classification up to orders. Metagenesis in *Obelia* Polymorphism in Cnidaria Corals and coral reef diversity, function & conservation	SND
		Ctenophora General characteristics	PP
		Platyhelminthes General characteristics and Classification up to classes Life cycle and pathogenicity and control measures of *Fasciola hepatica* and *Taenia solium*	PP
		Nematoda General characteristics and Classification up to classes Life cycle, and pathogenicity and control measures of *Ascaris lumbricoides and Wuchereria bancrofti*	PP

CC-2 (Theory)

Sem	Paper	Subject Topic	Asign Teacher
I (Hons)	CC-2 **Ecology**	**Introduction to Ecology** History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.	PKM
		Population Unitary and Modular populations Unique and group attributes of population: Demographic factors, life tables, fecundity tables, survivorship curves, dispersal and dispersion. Geometric, exponential and logistic growth, equation and patterns, and K strategies. Population regulation, density dependent and independent factors Population Interactions, Gause's Principle with laboratory and field examples, Lotka-Volterra equation for competition	S.R.D
		Community Community characteristics: species diversity, abundance, , dominance, richness, Vertical stratification, Ecotone and edge effect. succession with one example	S.R.D
		Ecosystem Types of ecosystem with an example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies Nutrient and biogeochemical cycle with an example of Nitrogen cycle Human modified ecosystem	PKM
		Applied Ecology Wildlife Conservation (in-situ and ex-situ conservation). Management strategies for tiger conservation; Wild life protection act (1972)	BS

GE/CC-1 (Theory)

Sem	Paper	Subject Topic	Asign Teacher
I General	CC-1 **ANIMAL DIVERSITY**	**Kingdom Protista** General characters and classification of Subkingdom Protozoa up to Phylum (Levine *et al.*, 1980); Locomotory Organelles and locomotion in Protozoa	EM
		Phylum Porifera General characters and classification up to classes; Canal System in *Sycon*	EM
		Phylum Cnidaria General characters and classification up to classes; Polymorphism in Hydrozoa.	EM
		Phylum Platyhelminthes General characters and classification up to classes; Life history of *Taenia solium*	PP
		Phylum Nematoda General characters and classification up to classes; Life history of *Ascaris lumbricoides* and its parasitic adaptations	PP
		Phylum Annelida General characters and classification up to classes; Nephridia in Annelida	EM
		Phylum Arthropoda General characters and classification up to classes; Vision in insect, Metamorphosis in Insects	EM
		Phylum Mollusca General characters and classification up to classes; Respiration in *Pila*	EM
		Phylum Echinodermata General characters and classification up to classes; Water-vascular system in Asterias	EM
		Protochordates General features; Feeding in *Branchiostoma*	PP
		Agnatha General features and classification up to classes (Young, 1981)	PP
		Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	SRD
		Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	SRD
		Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non-poisonous snakes, Biting mechanism in snakes	SRD
		Aves General features and Classification up to orders (Young, 1981); Flight adaptations in birds	SRD
		Mammals Classification up to Subclasses (Young, 1981); Origin & distribution of Cranial nerves in *Cavia*	SRD

Practical

CC-1

Sem	Paper	Subject Topic	Asign Teacher
I (Hons)	CC1 **Non-Chordates I** Chordates-I	Preparation of stained whole mount of *Euglena, Amoeba and Paramoecium*	EM
		Spot Identification of *Amoeba, Euglena, Entamoeba, Opalina, Paramecium, Plasmodium vivax and Plasmodium falciparum* (from the prepared slides)	EM
		Spot Identification of *Sycon, Neptune's Cup, Obelia, Physalia, Millepora ,Aurelia,*	SND
		Spot Identification of *Tubipora,Corallium,Alcyonium,Gorgonia,Metridium,Pennatula,Fungia,Meandrina,Madrepora*	SND
		Spot Identification and significance of adult Fasciola hepatica, Taenia solium and Ascaris lumbricoides.	PP
		Staining/mounting of any protozoa/helminth from gut of cockroach	PP

CC-2

Sem	Paper	Subject Topic	Asign Teacher
I (Hons)	CC-2 **Ecology**	Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided	SRD
		Determination of population density in a natural/hypothetical community by quadrate method and calculation of Shannon-Weiner diversity index for the same community	PKM
		Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, determination of pH and free CO_2	PKM & BS
		Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/ Biodiversity Centre/ Any Museum/Sea shore	BS

GE/CC-1

Sem	Paper	Subject Topic	Asign Teacher
I GEN	CC-1 **ANIMAL DIVERSITY**	Spot identification of the following specimens: *Amoeba, Euglena, Plasmodium, Paramecium, Sycon, Euspongia,, Obelia, Physalia, Aurelia, Tubipora, Metridium, Taenia solium,* Male and female *Ascaris lumbricoides, Aphrodite, Nereis, Pheretima, Hirudinaria, Palaemon, Cancer, Limulus, Palamnaeus, Scolopendra, Julus, Periplaneta, Apis, Chiton, Dentalium, Pila, Unio, Loligo, Sepia, Octopus, Pentaceros, Ophiura, Echinus, Cucumaria* and *Antedon, Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis, Passer, Psittacula, Alcedo, Sorex, Pteropus, Funambulus, Suncus*	PP
		Study of the following permanent slides: Transverse section of male and female *Ascaris*	
		Identification of poisonous and non-poisonous snakes	
		An "animal album" containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.	

Sem -III

CC-5 (Theory)

Sem	Paper	Subject Topic	Asign Teacher
III HONS	**Chordates** CC-5	**Introduction to Chordates** General characteristics and outline classification of Phylum Chordata	PP
		Protochordata 1. General characteristics and classification of sub-phylum Urochordata and Cephalochordate up to Classes. 2. Retrogressive metamorphosis in Ascidia. 3. Chordate Features and Feeding in Branchiostoma	PP
		Origin of Chordata 1. Dipleurula concept and the Echinoderm theory of origin of chordates 2. Advanced features of vertebrates over Protochordata	PP
		Agnatha General characteristics and classification of cyclostomes up to order	PP
		Pisces 1. General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses 2. Accessory respiratory organ, migration and parental caring fishes 3. Swim bladder in fish	PP
		Amphibia 1. General characteristics and classification unto living Orders. 2. Metamorphosis and parental care in Amphibia	BS
		Reptilia 1. General characteristics and classification up to living Orders. 2. Poison apparatus and Biting mechanism in Snake	BS
		Aves 1. General characteristics and classification up to Sub-Classes 2. Exoskeleton and migration in Birds 3. Principles and aerodynamics off flight	BS
		Mammals 1. General characters and classification up to living orders 2. Affinities of Prototheria 3. Exoskeleton derivatives of mammals 4. Adaptive radiation in mammals with reference to locomotory appendages 5. Echolocation in Micro-chiropterans and Cetaceans	BS
		Zoogeography Zoogeographical realms, Plate tectonic and Continental drift theory, distribution of birds and mammals in different realms	BS

CC-6 (Theory)

SEM	Paper	Subject	Assigned Teacher
III HONS	**Animal Physiology: Controlling & Coordinating Systems** CC-6	**Tissues** Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue	SND
		Bone and Cartilage Structure and types of bones and cartilages, Ossification	SND
		Nervous System 1. Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers. 2. Types of synapse, Synaptic transmission and Neuro-muscular junction; 3. Reflex action and its types	SND
		Muscular System 1. Histology of different types of muscle; 2. Ultra-structure of skeletal muscle; 3. Molecular and chemical basis of muscle contraction; Characteristics of muscle fibre	SND
		Reproductive System 1. Histology of testis and ovary 2. Physiology of Reproduction (Estrus and Menstrual cycle)	EM
		Endocrine System 1. Histology and function of pituitary, thyroid, pancreas and adrenal 2. Classification of hormones; 3. Mechanism of Hormone action: Signal transduction pathways for Steroidal and Nonsteroidal hormones 4. Hypothalamus (neuroendocrine gland) – principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system 5. Placental hormones	EM

CC-7 (Theory)

Sem	Topic	Subject	Teacher
III HONS	**Fundamentals of Biochemistry** CC-7	**Carbohydrates** 1. Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosachharides 2. Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis	SRD
		Lipids 1. Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Tri- acyl glycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. 2. Lipid metabolism: β-oxidation of fatty acids; Fatty acid biosynthesis	PKM
		Proteins 1. Amino acids : Structure, Classification, General and Electrochemical properties of α-amino acids; Physiological importance of essential and non-essential amino acids 2. Proteins: Bonds stabilizing protein structure; Levels of organization 3. Protein metabolism: Transamination, Deamination, Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids	PKM
		Nucleic Acids 1. Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids 2. Types of DNA and RNA, Complementarity of DNA, Hypo-Hyper chromaticity of DNA 3. Basic concept of nucleotide metabolism	SRD
		:**Enzymes** 1. Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes 2. Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten Equation, Lineweaver-Burk plot; Factors affecting rate of enzyme- catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their Factors affecting rate of enzyme-catalyzed reactions; 3. Enzyme inhibition; Allosteric enzymes and their kinetics; Strategy of enzyme action4. Catalytic and Regulatory (Basic concept with one example each)	SRD
		Oxidative Phosphorylation Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron.	SRD

SEC-1

SEC-Apiculture/ Sericulture

Sem	Topic	Subject	Teacher
III HONS	**SEC T1 – Apiculture**	**Biology of Bees** 1. History, Classification and Biology of Honey Bees 2. Social Organization of Bee Colony	SND
		Rearing of Bees 1. Artificial Beer earing (Apiary),Beehives–Newton and Langstroth. 2. Bee Pasturage. 3. Selection of Bee Species for Apiculture. 4. Bee Keeping Equipment. 5. Methods of Extraction of Honey (Indigenous and Modern).	EM
		Diseases and Enemies Bee Diseases and Enemies, Control and Preventive measures	PKM
		Bee Economy Products of Apiculture Industry and its Uses(Honey, Bees Wax, Propolis), Pollenetc	PP
		Entrepreneurshipin Apiculture Bee Keeping Industry–Recent Efforts, Modern Methods in employing artificial Beehives for cross pollination in horticultural gardens	SND

Sem	Topic	Subject	Teacher
III HONS	**SEC T1–Sericulture**	**Introduction** 1. Sericulture: Definition, history and present status; Silk route 2. Types of silkworms, Distribution and Races , Exotic and indigenous races Mulberry and nonmulberry Sericulture	S.N.D
		Biology of Silkworm 1. Life cycle of Bombyx mori 2. Structure of silk gland and secretion of silk	S.N.D
		Rearing of Silk worms 1. Selection of mulberry variety and establishment of mulberry garden 2. Rearing house and rearing appliances. Disinfectants: Formalin, bleaching powder, RKO 3. Silkworm rearing technology: Early age and Late age rearing 4. Types of mount ages 5. Spinning, harvesting and storage of cocoons.	E.M
		Pests and Diseases 1. Pests of silkworm :Uzifly, dermestid beetles and vertebrates 2. Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial 3. Control and prevention of pests and diseases	P.P
		Entrepreneurshipin Sericulture 1. Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture 2. Visit to various sericulture centers.	P.K.M

GE/CC-3 (General)

SEM	Topic	Subject	Teacher
III General	**PHYSIOLOGY AND BIOCHEMISTRY**	**Nerve and muscle** 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	EM
		Digestion Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids	EM
		Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	EM
		Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	EM
		Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle.	EM
		Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of pituitary, thyroid, pancreas and adrenal	EM
		Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Isomerism, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Pentose phosphate pathway, Gluconeogenesis, Electron transport chain	SRD
		Lipid: Structure and Metabolism Introduction to Lipids: Definitions; fats and oils; classes of lipids; Lipoproteins; Biosynthesis and β oxidation of palmitic acid	PP
		Protein: Structure and metabolism Proteins and their biological functions, functions of amino acids, physicochemical properties of amino acids. Peptides – structure and properties; primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination and Urea Cycle.	PP
		Enzymes Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	SRD

CC-5 [Practical]

Sem	Topic	Subject	Teacher
III HONS	**Chordates** CC-5	Spot identification of a. Protochordata : Balanoglossus, Herdmania, Branchiostoma b. Agnatha: Petromyzon, Myxine c. Fishes: Scoliodon,Sphyrna,Pristis, Torpedo, Chimaera, Mystus, Heteropneustes, Labeo, Catla, Cirrhinus, Hypopthalmichthys, Cyprinus, Ctenopharyngodon,Exocoetus, Echeneis, Anguilla, Hippocampus,Tetrodon/Diodon, Anabas, Clarias d. Amphibia: Necturus, Bufo, Hyla, Alytes, Axolotl larva, Tylototriton e. Reptilia: Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Mabuya, Draco, Bungarus, Vipera, Naja, Hydrophis f. Mammalia: Bat (Insectivorous and Frugivorous), Funambulus	BS & PP
		Key for Identification of poisonous and non-poisonous snake	BS
		Mounting of Pecten from Fowl head	PP
		. Dissection of brain and pituitary of any major carp	PP
		Power point presentation on study of any two animals from two different classes by students (may be included if dissections not permitted	BS

CC-6 [Practical]

Sem	Topic	Subject	Teacher
III HONS	**Animal Physiology: Controlling &Coordinating Systems** CC-6	Recording of simple muscle twitch with electrical stimulation (or Virtual)	EM
		Demonstration of the unconditioned reflex action(Deep tendon reflex suchas knee jerk reflex)	SND
		Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres	SND
		Identification of permanent slides of Mammalian Cartilage, Bone, Pituitary, Liver, Kidney, Intestine, Lung, Pancreas, Testis, Ovary, Adrenal, Thyroid	SND & EM
		Microtomy: Preparation of permanent slide of any five mammalian(Goat/white rat)tissues	SND & EM &PP & BS & PKM & SRD

CC-7 [Practical]

Sem	Topic	Subject	Teacher
III HONS	**Fundamentals of Biochemistry** CC-7	Qualitative tests of functional groups in carbohydrates (Benedict's test), proteins (Biuret's test) and lipids (Saponification number).	SRD
		Paper chromatography of amino acids	PKM
		. Quantitative estimation of protein by Lowry Method	SRD
		Demonstration of protein separation by SDS-PAGE	PKM
		To study the enzymatic activity of Salivary amylase and Catalase in *Cajanus cajan*.	PKM

GE/CC-3 [Practical]

Sem	Topic	Subject	Teacher
III GEN	**PHYSIOLOGY AND BIOCHEMISTRY** PRACTICAL GE/CC-3	Preparation of hemin crystals	PP
		Identification of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland, small intestine, liver, lung, kidney	EM
		Qualitative tests to identify functional groups of carbohydrates in given solutions: Glucose (Benedict's test),Sucrose (Iodine test)	SRD
		Quantitative estimation of total protein in given solutions by Lowry's method.	SRD
		. Study of activity of salivary amylase under optimum conditions	SRD

SEM –V

CC-11

Sem	Topic	Subject	Teacher
V HONS	**Molecular Biology** CC-11	**Nucleic Acids** 1. Salient features of DNA and RNA 2. Watson and Crick Model of DNA	SRD
		DNA Replication 1. Mechanism of DNA Replication in Prokaryotes, Semi-conservative, bidirectional and discontinuous Replication, RNA priming, 2. Replication of telomeres	SRD
		Transcription Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.	SRD
		Translation 1. Mechanism of protein synthesis in prokaryotes, 2. Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; 3. Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; 4. Inhibitors of protein synthesis; 5. Difference between prokaryotic and eukaryotic translation	SRD
		Post Transcriptional Modificationsand Processing of Eukaryotic RNA 1. Capping and Poly A tail formation in mRNA; 2. Split genes: concept of introns and exons, splicing mechanism, alternative splicing, Exon shuffling, and RNA editing, 3. Processing of tRNA	PKM
		Gene Regulation 1. Regulation of Transcription in prokaryotes: lac operon and trp operon; 2. Regulation of Transcription in eukaryotes: Activators, enhancers, silencer, repressors, 3. miRNA mediated gene silencing, 4. Genetic imprinting	PKM
		DNA Repair Mechanisms Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair	PKM
		Principles of Molecular Techniques 1. PCR 2. Western and Southern blot 3. Northern Blot 4. Sanger DNA sequencing	PKM

CC-12

Sem	Topic	Subject	Teacher
V HONS	**Genetics** CC-12	**Mendelian Genetics and its Extension** 1. Principles of inheritance, Incomplete dominance and co-dominance, Epistasis Multiple alleles, Lethal alleles, Pleiotropy 2. Sex-linked, sex-influenced and sex-limited inheritance, 3. Polygenic Inheritance.	PP
		Linkage, Crossing Over and Chromosomal Mapping 1. Linkage and Crossing Over, molecular basis of crossing over, 2. Measuring Recombination frequency and linkage intensity using three factor crosses, Interference and coincidence	PP
		Mutations 1. Types of gene mutations(Classification), 2. Types of chromosomal aberrations(Classification with one suitable example of each), 3. Non-disjunction and variation in chromosome number; 4. Molecular basis of mutations in relation to UV light and chemical mutagens.	PP
		Sex Determination 1. Mechanisms of sex determination in Drosophila 2. Sex determination in mammals 3. Dosage compensation in Drosophila & Human	SND
		Extra-chromosomal Inheritance 1. Criteria for extra chromosomal inheritance, Antibiotic resistance in Chlamyadomonas, 2. Kappa particle in Paramoecium 3. Shell spiralling in snail	SND
		Recombination in Bacteria and Viruses 1. Conjugation, Transformation, Transduction, 2. Complementation test in Bacteriophage	SND
		Transposable Genetic Elements 1. Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila, 2. LINE, SINE, Alu elements in humans	SND

DSE – 1 & 2

SEM	Paper	Subject	Teacher
V HONS	**Animal Biotechnology** DSE T1	**Introduction** 1. Organization of prokaryotic and eukaryotic genome, 2. Concept of genomics	BS
		Molecular Techniques in Gene Manipulation 1. Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, M13, BAC, YAC, MAC and Expression vectors (characteristics). 2. Restriction enzymes: Nomenclature, detailed study of Type II. 3. Transformation techniques: Calcium chloride method and electroporation. 4. Construction of genomic and cDNA libraries and screening by colony and plaque hybridization 5. Southern, Northern and Western blotting 6. DNA sequencing: Sanger method 7. Polymerase Chain Reaction, DNA Fingerprinting and DNA microarray	BS
		Genetically Modified Organisms 1. Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection. 2. Applications of transgenic animals: Production of pharmaceuticals, production of donor organs, knockout mice.	PKM
		CultureTechniquesand Applications 1. Animal cell culture, 2. Expressing cloned genes in mammalian cells, 3. Molecular diagnosis of genetic diseases (Cystic fibrosis, Sickle cell anaemia)	PKM

SEM	Paper	Subject	Teacher
V HONS	**Microbiology** DSE T2	**Introduction to Microbiology** Historical perspective of Microbiology, Prokaryotic pathogens, Eukaryotic pathogens	PKM
		Bacterial Taxonomy Principles and modern approaches of bacterial taxonomy. Basic idea about Hackel and Whittaker's kingdom concept and domain concept of Carl Woose	PKM
		Morphology of Bacteria and Virus Cell wall (Structure of peptidoglycan), Cell envelope (Cell membrane, Differences between gram- positive and gram-negative species, External capsule and glycocalyx, Plasmids and episomes. Nuclear material, Bacterial Chromosome (Fundamental differences with eukaryotic chromosome). Reserve materials (carbon and phosphate reserve, cyanophycin), Cytoplasmic inclusions (Chlorosome, magnetosome, carboxysome, gasvesicles, ribosome). Structural organization of viruses, Prions and viroids	PKM
		Normal flora Distribution of normal flora in the body: Skin, eye, mouth, intestinal tract, urino-genital tract, Beneficial functions of normal flora. Harmful effects of normal flora	BS
		Pathogenicity of Microorganisms Bacterial pathogenesis: Entry to the host, Adherence to host cells, Invasiveness, Bacterial toxins: Exotoxins, Endotoxins, Antigenic switching. Viral Pathogenesis: Cellular level(Cell death, Transformation, Cell fusion, Cytopathic effect).Initial infections: Routes of entry and dissemination to secondary sites, Typical secondary sites of localization, Virus shedding and mode of transmission; Factors involved intermination of acute infection	BS
		Infection of pathogens to human populations Communicable, Non-communicable, Endemic, Epidemic, Pandemic and Sporadic	BS
		Diagnostic Microbiology and Bacteria culture Koch's postulates, Sensitivity and specificity of test results, Principles and applications: Simple staining, Gram-staining, Acid-fast staining, Collection of specimens, Growth requirements and Growth factors, Oxygen requirement. Culture Media: Simple media, Complex media, Selective media and Enriched media	PKM
		Genetic recombination in bacteria Transformation, Conjugation-F+, F-, Hfr & F' strain, Transduction, Generalized & specialized types	BS

DSE – 3 & 4

SEM	Paper	Subject	Teacher
V HONS	**Parasitology** DSE T3	**Introduction to Parasitology** 1. Brief introduction of Parasitism, Parasite, Parasitoid and Vectors (mechanical and biological vector) 2. Host parasite relationship	EM
		Parasitic Protists Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Giardia intestinalis, Trypanosoma gambiense, Leishmania donovani*	EM
		Parasitic Platyhelminthes Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Schistosoma haematobium, Taenia sajinata*	EM
		ParasiticNematodes 1. Study of Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment of *Ascaris lumbricoides, Ancylostoma duodenale, Wuchereria bancrofti and Trichinella spiralis, Brugiamalayi;* 2. Nematode plant interaction ; Gall formation	PP
		Parasitic Arthropods Biology, importance and control of ticks (Soft tick *Ornithodoros,* Hard tick *Ixodes*),mites (*Sarcoptes*), Lice (*Pediculus*),Flea (*Xenopsylla*) and Bug (*Cimex*)	PP
		Parasite Vertebrates Brief account of Cookicutter Shark, Hood Mocking bird, Vampire bat	PP

SEM	Paper	Subject	Teacher
V HONS	**Biology of Insects** **DSE T4**	**Introduction** 1. General Features of Insects 2. Distribution and Success of Insects on the Earth	EM
		Insect Taxonomy Basis of insect classification; Classification of insects up to orders (according to Brusca and Brusca, 2016)	EM
		General Morphology of Insects 1. External Features; Head–Eyes, Types of antennae, Mouth parts w.r.t .feeding habits 2. Thorax: Wings and wing articulation, Types of Legs adapted to diverse habitat 3. Abdominal appendages and genitalia	EM
		Physiology of Insects 1. Structure and physiology of Insect body systems - Integumentary, digestive, excretory, circulatory, respiratory, endocrine, reproductive, and nervous system 2. Photoreceptors: Types, Structure and Function 3. Metamorphosis: Types and Neuroendocrine control of metamorphosis	PP
		Insect Society 1. Social insects with special reference to termites 2. Trophallaxis in social insects such as ants, termites and bees	PP
		Insect Plant Interaction 1. Theory of co-evolution, role of allelochemicals in host-plant mediation 2. Host-plant selection by phytophagous insects, 3. Major insect pests in paddy	PP
		Insects as Vectors 1. Insects as mechanical and biological vectors, 2. Brief discussion on houseflies and mosquitoes as important vectors	PP

DSE- 1 General

SEM	PAPER	SUBJECT	TEACHER
V HONS	**Applied Zoology** DSE-1	**Introduction to Host-parasite Relationship** Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis.	SRD
		Epidemiology of Diseases Transmission, Prevention and control of diseases: Tuberculosis, Typhoid	EM
		Rickettsia and Spirochetes Brief account of **Rickettsia prowazekii**, *Borrelia recurrentis and Treponema pallidum*.	EM
		Parasitic Protozoa Life history and pathogenicity of *Entamoeba histolytica*, *Plasmodium vivax* and *Trypanosoma gambiense*	SRD
		Parasitic Helminthes Life history and pathogenicity of *Ancylostoma duodenale* and *Wuchereria bancrofti*	SRD
		Insects of Economic Importance Biology, Control and damage caused by *Helicoverpa armigera, Pyrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum*	EM
		Insects of Medical Importance Medical importance and control of *Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis*	EM
		Animal Husbandry Preservation of semen and artificial insemination in cattle	EM
		Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs	EM
		Fish Technology Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	EM

SEM	PAPER	SUBJECT	TEACHER
V HONS	**AQUATIC BIOLOGY** DSE-1	**Aquatic Biomes** Brief introduction to the aquatic biomes: Fresh water ecosystem(lakes, wetlands, streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs	EM
		Freshwater Biology **Lakes**: Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico–chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity, dissolved gases (Oxygen, Carbon dioxide). Nutrient Cycles in Lakes (Nitrogen, Sulphur and Phosphorous). **Streams**: Different stages of stream development, Physico-chemical environment, Adaptation of hill- stream fishes.	EM
		Marine Biology Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coral reefs, Sea weeds.	EM
		Management of Aquatic Resources Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment; Water quality assessment- BOD and COD.	SRD

SEC 3

Paper	Subject	Teacher
SERICULTURE SEC 3	**Introduction** Sericulture: Definition, history and present status; Silk route Types of silkworms, Distribution and Races; Exotic and indigenous races; Mulberry and non-mulberry Sericulture	SND
	Biology of Silkworm Life cycle of *Bombyx mori*; Structure of silk gland and secretion of silk	SND
	Rearing of Silkworms Selection of mulberry variety and establishment of mulberry garden; Rearing house and rearing appliances; Disinfectants: Formalin, bleaching powder, RKO. Silkworm rearing technology: Early age and Late age rearing. Types of mountages; Spinning, harvesting and storage of cocoons	EM
	Pests and Diseases Pests of silkworm: Uzi fly, demisted beetles and vertebrates Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial Control and prevention of pests and diseases	PP
	Entrepreneurship in Sericulture Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture. Visit to various sericulture centers.	PP

CC-11 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**Molecular Biology** CC-11	Preparation of polytene chromosome from Diptera (*Chironomus/ Drosophila/ Mosquito larva*)	PKM
		Identification of polytene and lampbrush chromosome from photograph	SRD
		Isolation and quantification of genomic DNA using spectrophotometer (A260 measurement) (demonstration only)	SRD
		Demonstration of agarose gel electrophoresis for DNA	SRD
		Study and interpretation of electron micrographs/ photographs showing a) DNA replication b) Transcription c) Split genes	SRD
		Preparation of liquid and solid bacterial culture media, slant and stab	BS
		Demonstration of antibiotic sensitivity/ resistance of bacteria to antibiotic discs	SRD

CC-12 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**Genetics** CC-12	Chi-square analyses	SND
		Problems of linkage maps on Drosophila	PP
		Identification of chromosomal aberration in Drosophila (inversion, ring chromosome, paracentric inversion) from photograph	PP
		Study of human karyotype, normal and abnormal (Down, Klinefelter, Turner's, Cri-du-Chat) from photograph	PP
		Pedigree analysis of some human inherited traits (X-linked dominant, X-linked recessive, autosomal dominant, autosomal recessive, Y-linked)	SND

DSE 1 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**Animal Biotechnology** DSE P1	. Construction of linear restriction map from the data provided.	BS
		Calculation of transformation efficiency from the data provided.	
		Study and identification of following techniques through photographs a. Southern Blotting b. Northern Blotting c. Western Blotting d. DNA Sequencing (Sanger's Method) e. PCR f. DNA fingerprinting	
		Project report on animal cell culture	

or

DSE 2 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**DSE P2- Microbiology**	Simple staining and Gram's staining of bacteria	BS
		Preparation of liquid media (broth) and solid media for routine cultivation of bacteria.	
		Preparation of slant and stab.	
		Pure culture techniques: Spread plate, Pour plate and Streak plate	
		Biochemical test for characterization, Catalase, Nitrate-reduction, Indole production, Methyl Red and Voges-Proskauer Test.	
		Microbiological examination of milk (Methylene blue reductase test), Sugar fermentation test	
		Submission of project report on water or soil bacteria	

DSE P3 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**Parasitology** DSE P3	Identification of life stages of *Giardia lamblia* and *Leishmania donovani* through permanent slides/microphotographs	EM
		. Identification of adult and life stages of *Schistosoma haematobium,Taenia solium* through permanent slides/microphotographs	
		Identification of adult and life stages of *Ancylostoma duodenale, Wuchereria bancrofti* and *Trichinella spiralis* through permanent slides/microphotographs	
		Identification of plant parasitic root knot nematode, *Meloidogyne* from the soil sample	
		. Identification *of Pediculus humanus, Xenopsyll acheopis and Cimex lectularius* through permanent slides/photographs	
		Isolation and fixation of nematode/cestode parasites from the intestine of hen[Intestine can be procured from poultry/market as a by-product]	
		Submission of a project report on any parasite of vertebrates	

Or

DSE P4 [Practical]

Sem	Topic	Subject	Teacher
V HONS	**Biology of Insects** DSE P4	Study of life cycle of Mosquito	EM
		Mounting and identification of different kinds of antennae, legs and mouth parts of insects	
		Mounting of insect wings, spiracles and genitalia of any insects	
		Methodology of collection, preservation and identification of insects.	
		Morphological studies of various castes of *Apis, Camponotus, Odontotermes*	
		Identification of major insect pests of paddy and their damages (*Nilaparvata, Scirpophaga, Hispa*)	
		Identification of Mulberry silk moth as beneficial insect	

General

DSE-1 [Practical]

Sem	Topic	Subject	Teacher
V GEN	Applied Zoology DSE-1	Study and Identification of *Plasmodium vivax, Entamoeba histolytica, Ancylostoma duodenale and Wuchereria bancrofti* and their life stages through permanent slides/photomicrographs or specimens.	PP
		Study and Identification of arthropod vectors associated with human diseases: *Pediculus, Culex,Anopheles, Aedes and Xenopsylla.*	
		Study and Identification of insect damage to different plant parts/stored grains through damaged products/photographs.	
		Identifying features and economic importance of *Nilaparvata lugens, Apion corchori, Scirpophaga incertulus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum*	
		Visit to poultry farm/ animal breeding centre/ vector biology/ parasitology Centre. Submission of visit report	
		Maintenance of freshwater aquarium	

or

Sem	Topic	Subject	Teacher
V GEN	Aquatic Biology DSE-1	Determine the area of a lake using graphimetric and gravimetric method.	PP
		Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.	
		Determine the amount of transparency, Dissolved Oxygen, and Free Carbon dioxide, in water collected from a nearby lake / water body.	
		Instruments used in limnology (Secchi disc, Van Dorn Bottle, Conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.	
		A Project Report on a Sewage treatment plant/Marine bio reserve/ Fisheries Institutes	

Routine

RABINDRA MAHAVIDYALAYA (CHAMPADANGA, HOOGHLY)

Department of Zoology

Total classes 84

CLASS ROUTINE FOR THE SESSION 2021-22 w.e.f. 16.11.2021

DAY	10:30-11:30			11:30-12:30			12.30-13.30			13.45-14.45			14.45-15.45			15.45-16.45		
Monday	3-ZOOH-	BS	13B	1-ZOOG-	EM	12C	1-ZOOH-	SRD	13B	3-ZOOH-	BS	13A	3-ZOOH-	PKM	13A			
	5-ZOOH-	SRD	13A	1-ZOOH-	SRD	13B	5-ZOOH-	BS	75	5-ZOOG-	SRD	12C	5-ZOOH-	EM	13B			
				3-ZOOH-	BS	13A				5-ZOOH-	EM	LAB						
				5-ZOOH-	PKM	75												
																		13
Tuesday	1-ZOOH-	PKM	75	1-ZOOG-	SRD	12C	1-ZOOH-	PP	13B	3-ZOOH-	PP	13B	3-ZOOH-	PP	13B			
	3-ZOOG-	PP	12C	1-ZOOH-	PP	13B	5-ZOOH-	PKM	13A	5-ZOOG-	SND	75	5-ZOOG-	SND	75			
	3-ZOOH-	SRD	13A	3-ZOOH-	PKM	75				5-ZOOH-	BS	13A	5-ZOOH-	BS	13A			
	5-ZOOH-	SND	13B	5-ZOOH-	SND	13A												
																		16
Wednessday	3-ZOOG-	SRD	12C	1-ZOOG-	PP	LAB	1-ZOOG-	PP	LAB	5-ZOOG-	PP	13B	5-ZOOG-	PP	13B			
	5-ZOOH-	BS	13B	1-ZOOH-	PKM	13B	1-ZOOH-	PKM	13B	5-ZOOH-	BS	13A	5-ZOOH-	PKM	13A			
				3-ZOOG-	SRD	12C	3-ZOOH-	SRD	13A									
				5-ZOOH-	SND	LAB	5-ZOOH-	SND	LAB									
																		14
Thursday	1-ZOOH-	BS	75	1-ZOOH-	EM	75	1-ZOOH-	EM	75	1-ZOOH-	BS	LAB	1-ZOOH-	BS	LAB			
	3-ZOOG-	EM	12C	3-ZOOH-	SRD	LAB	5-ZOOH-	BS	LAB	3-ZOOH-	SND	13A	3-ZOOH-	SND	13A			
	3-ZOOH-	SRD	13A	5-ZOOH-	BS	LAB				5-ZOOG-	SRD	12C	5-ZOOG-	SRD	12C			
	5-ZOOH-	SND	13B							5-ZOOH-	PP	LAB	5-ZOOH-	PP	13B			
																		17
Friday	3-ZOOG-	SRD	75	3-ZOOH-	SND	13B	5-ZOOH-	SRD	13A	3-ZOOH-	EM	13B	3-ZOOH-	EM	13B			
	3-ZOOH-	BS	13A	5-ZOOH-	SRD	13A				5-ZOOG-	PP	76	5-ZOOG-	SND	76			
	5-ZOOH-	SND	13B							5-ZOOH-	BS	13A	5-ZOOH-	BS	13A			
																		12
Saturday	3-ZOOG-	EM	13B	1-ZOOH-	SND	13B	1-ZOOH-	SND	13B	1-ZOOH-	EM	13A	1-ZOOH-	SND	13A			
	3-ZOOH-	PKM	13A	3-ZOOH-	PKM	13A	5-ZOOH-	EM	13A	3-ZOOH-	SND	76	5-ZOOG-	EM	75			
										5-ZOOH-	PKM	13B	5-ZOOH-	PKM	13B			
																		12
	17			19			13			18			17			0		

BS = Dr. Baisakhi Saha EM = Eureka Mandal PKM = Palas Kanti Manna PP = Piyali Pakhira
SND = SUDHA ANJELA DHAN SRD = Souren Dutta