

LESSON PLAN
DEPARTMENT: ZOOLOGY

NAME OF FACULTY: DR. DEBJANI DAS GHOSH, SUCHONA CHAKRABORTY & DR. SUMALLYA KARMAKAR
SEMESTER-II

Subject: Zoology Hons. (Major)

Paper: Core Course (Biochemistry) - CC2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Carbohydrate</u> Structure Classification Properties of Monosaccharide, Disaccharide & Polysaccharide	4	1)Biochemistry .. by D. Das 2) Principles of Biochemistry .. by Lehninger	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
	Isomerism of monosaccharide	4			
	Importance	1	3) Illustrated Biochemistr		

Unit 2	<u>Protein</u> Structure of amino acid Classification of amino acid Properties (General & electrochemical) Essential & nonessential amino acid	4	..by Harper		
	Structure of protein (primary, secondary, tertiary & quaternary)	3			
Unit 3	<u>Lipid</u> Classification Saturated & unsaturated fatty acid Essential & non-essential fatty acid	2			
	Structure & Formation of triglyceride	1			
Unit 4	<u>Enzymes</u> Nomenclature, classification; cofactors; specificity of enzyme action; isozymes; Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation; Lineweaver-Burk plot; Factors affecting rate of enzyme catalysed reactions; Enzyme inhibition	9	Cox and Nelson: Lehninger's principles of biochemistry, Hames and Hooper: Harper's illustrated biochemistry, D. Das: Fundamentals of Biochemistry etc.	1. chalk and talk 2. Peer teaching 3. class test 4. Study materials 5. reference notes	Dr. Debjani Das (Ghosh)

Unit 5	<u>Carbohydrate metabolism</u> Glycolysis Citric acid cycle	3	1) Biochemistry by D. Das 2) Principles of Biochemistry .. by Lehninger 3) Illustrated Biochemistry ..by Harper	1. Class lecture 2. PDF 3. Reference Notes	Suchona Chakraborty
	Pentose phosphate pathway	1			
	Gluconeogenesis	1			
	Glycogenesis & Glycogenolysis	2			
Unit 6	<u>Protein metabolism</u> Transamination, Deamination, Glycogenic & Ketogenic amino acid	4			
Unit 7	<u>Lipid metabolism</u> Beta –oxidation of – Palmitic acid & Linoleic acid	3			
	Fatty acid biosynthesis	1			
Unit 8	<u>Nucleic Acid Metabolism</u> Degradation of purine, Purine Salvage pathway and significance	3	1) Principles of Biochemistry .. by Lehninger	1. Class lecture 2. PDF 3. Reference Notes	Dr. Sumallya Karmakar

Unit 9	Free radicals & antioxidants	1	1)Biochemistry .. by D. Das 2) Principles of Biochemistry .. by Lehninger 3) Illustrated Biochemistry ..by Harper	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
<u>Practical</u> Group -A	<u>Qualitative test</u> Carbohydrate	6	1)Practical Zoology by Chatterjee & Chakraborty 2)Practical Zoology by Ghosh Manna 3)Laboratory Manual by Poddar	Chemicals & lab apparatus	Suchona Chakraborty
	Protein	3			
	Lipid	1			
Group-B	<u>COLORIMETRIC ESTIMATION</u>	04	ABSORPTIOMETRY AND "COLORIMETRIC ANALYSIS":H.N.Wison	Hands on experiment and study materials	Dr. Debjani Das(Ghosh)

LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. SUCHARITA SAHA
SEMESTER-II

Subject: Zoology Hons. (Major)

Paper: Skill Enhancement Course (Aquaculture)-SEC-2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments

<p>Unit-1</p>	<p><u>Basic idea of Fish Biology</u> Qualities of cultivable fish, Indegenous and exotic</p>	<p>3</p>	<p>1.Sarkar, S., Kundu , G. and Chaki, K.C. (2014) . Introduction to Economic Zoology, NCBA, Kolkata</p> <p>2.Pandey, K. and Shukla,J.P. (2013). Fish and Fisheries, Rastogi Publications</p> <p>3.Dias, M.K. and Dias, R.K. (1997). Fish and Prawn Diseases in India--diagnosis and Contro. Inland Fisheries Society in India, Barrackpore, West Bengal</p>		<p>Dr. Sucharita Saha</p>
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<p>Unit-2</p>	<p><u>Sustainable aquaculture system</u> Intensive, semi-intensive and extensive culture systems, Water quality in culture ponds and factors controlling water quality. Preparation and management of fish culture ponds in Composite Fish Culture, Cage Culture, Pen culture, raceways flowthrough system, Biofloc. Cold water fishery, Joel fishery, Sewage-fed Fishery, mariculture with special emphasis on sea-weed culture (Basic concept). Induced breeding of Carps, synthetic hormones in hypophysation. Management of fin-fish Hatcheries, glass-jar hatchery. Chinese hatchery</p>	<p>17</p>			
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Unit-3	<u>Recent Advancement of Aquaculture</u> Aquarium Fisheries, Preparation and management of Fish Aquarium. Biology of common ornamental fish: Guppy, swordtail, Angel, Blue morph fish, Anemone fish, Butterfly fish, Molly. Fish Nutritional Requirement: Feed formulation and preparation of compound diets. Capture fishery: Fishing crafts and gears, post-harvesting Technology, fish Transport and marketing. Fish preservation and by-products. Fish biotechnology: transgenic Fish, Sex-reversal in Fish, Aquaponics, Application of GIS and remote -sensing in Fisheries, fishery laws and regulations.	20			
Unit-4	<u>Fin-fish Pathology</u> Name of infective disease. Causative Agents, Symptoms, Control. Bacterial-- Dropsy, Fin and tail rot, Protozoan--White spot disease, Fungal--Saprolegniasis, Ectoparasitic--Gyrodactylosis, dactylogyrosis, Viral— Rhabdovirus.	5			

Unit-5	<u>Applied Aquaculture</u> Breeding Techniques in Shrimp and Prawns: Eye-stalk Ablation in Shrimp and Salinity-shock in Prawns. Techniques of artificial Pearl Culture.	5			
Practical	<u>Identification of different fish species using meristic Characters (Systematic Position, Speimen Characters).</u> Rohu, Catla, Cirrhinus, Puntius, Amblypharyngodon, Channa punctatus, Lates, Mystus, Notopterus, Cyprinus, Hypophthalmichthyes, Ctenopharyngodon, Oreochromis niloticus, Oreochromis mossambicus, anabas, Clarius, Heteropneustes, Mugil, Macrobrachium, Penaeus		Ghosh, K.C., Manna, B.-- Practical Zoology, NCBA		Dr. Sucharita Saha
	<u>Visit to any aquaculture farm and submission of report on the visit</u>				

LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. DEBJANI DAS GHOSH, SUCHONA CHAKRABORTY & DR. SUMALLYA KARMAKAR
SEMESTER-II

Subject: Zoology Gen. (Minor & MDC)
Paper: Core Course (Biochemistry) - CC2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Carbohydrate</u> Structure Classification Properties of Monosaccharide, Disaccharide & Polysaccharide	4	1)Biochemistry .. by D. Das 2) Principles of Biochemistry .. by Lehninger	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
	Isomerism of monosaccharide	4			
	Importance	1	3) Illustrated Biochemistry		

Unit 2	<u>Protein</u> Structure of amino acid Classification of amino acid Properties (General & electrochemical) Essential & nonessential amino acid	4	..by Harper		
	Structure of protein (primary, secondary, tertiary & quaternary)	3			
Unit 3	<u>Lipid</u> Classification Saturated & unsaturated fatty acid Essential & non-essential fatty acid	2			
	Structure & Formation of triglyceride	1			

Unit 4	<u>ENZYMES</u> Nomenclature, classification; cofactors; specificity of enzyme action; isozymes; Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation; Lineweaver-Burk plot; Factors affecting rate of enzyme catalysed reactions; Enzyme inhibition	9	D. Das: Fundamentals of Biochemistry, Harper's illustrated biochemistry	1. Chalk and Talk 2. Reference Materials	Dr. Debjani Das (Ghosh)
Unit 5	<u>Carbohydrate metabolism</u> Glycolysis Citric acid cycle	3	1)Biochemistry .. by D. Das 2) Principles of Biochemistry .. by Lehninger 3) Illustrated Biochemistry ..by Harper	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
	Pentose phosphate pathway	1			
	Gluconeogenesis	1			
	Glycogenesis & Glycogenolysis	2			
Unit 6	<u>Protein metabolism</u> Transaminaton, Deamination, Glycogenic & Ketogenic amino acid	4			
Unit 7	<u>Lipid metabolism</u> Beta –oxidation of – Palmitic acid & Linoleic acid	3			
	Fatty acid biosynthesis	1			

Unit 8	<u>Nucleic Acid Metabolism</u> Degradation of purine, Purine Salvage pathway and significance	3	1) Principles of Biochemistry .. by Lehninger	1.Class lecture 2.PDF 3.Reference Notes	Dr. Sumallya Karmakar
Unit 9	Free radicals & antioxidants	1	1)Biochemistry .. by D. Das 2) Principles of Biochemistry .. by Lehninger 3) Illustrated Biochemistry ..by Harper	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
<u>Practical</u> Group -A	<u>Qualitative test</u> Carbohydrate	6	1)Practical Zoology by Chatterjee & Chakraborty 2)Practical Zoology by Ghosh Manna 3)Laboratory Manual by Poddar	Chemicals & lab apparatus	Suchona Chakraborty
	Protein	3			
	Lipid	1			
Group-B	<u>COLORIMETRIC ESTIMATION</u>	04	ABSORPTIOMETRY AND "COLORIMETRIC ANALYSIS":H.N.Wison	Hands on experiment and study materials	Dr. Debjani Das (Ghosh)

LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. PATRALEKHA MUKHOPADHYAY, DR. SUCHARITA SAHA, DR. DEBJANI DAS (GHOSH)
SEMESTER-II

Subject: Zoology Gen. (MDC)

Paper: Skill Enhancement Course (Applied Entomology)-SEC- 2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit I	Agricultural Entomology	6	1.Economic Zoology: Shukla & Upadhyay 2. Introduction to Economic Zoology: Sarkar, Kundu, Chaki 3. Elementary Applied Zoology: Debajyoti Chattopadhyay	1.Chalk & Talk method 2.Power Point presentation 3.Use of Charts	Dr. Patralekha Mukhopadhyay
	Concept of insect pest, EIL, ETL	1			
	Life cycle, Nature of damage and control measures of pests of major crops	3			
	Insect Pest Control	2			
Unit II	Sericulture	8	1.A.Sukla: A handbook of Economic Zoology, 2.Chaki, Kundu and Sarkar: Introduction to economic Zoology,	1.Photographs 2. Chalk and talk 3. Study materials	Dr. Debjani Das Ghosh
	Types of silk moths, geographical distribution, host plants	2			

	Life cycle of <i>B.mori</i> , silk gland, composition of silk, uses of silk	2	3.Chaudhuri: Economic Zoology etc.		
	Rearing, extraction, reeling of mulberry silk	2			
	Silkworm diseases, pests and their control	2			
Unit III	Apiculture	7			
	Various domesticated species of Honey bee	2			
	Social organization and life cycle	1			
	Modern method of bee keeping	1			
	Parasites and diseases and control	2			
	Bee economy	1			

Unit IV	Vermiculture Scope of vermiculture, habit categories of earthworm, methodology of vermicomposting, containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of vermicompost, advantages of vermicomposting, diseases and pests of earthworm	7	Lekshmy , M.S. and Santhi, R. Vermitechnology. Saras Publication. ISBN:9789382459323	1.Chalk and talk 2. Link share	Dr. Sucharita Saha
Unit V	Aquaculture Aquaculture Principles, definition and scope, prawn culture: penaeid and palaemonid features with examples, semi-intensive method of prawn culture, application of prawn culture, difference between major and minor carps with examples. Composite fish farming: general concepts, advantages and disadvantages, Induced breeding; method and advantages, integrated fish farming	8	Pandey, K. and Shukla,J.P. (2013). Fish and Fisheries, Rastogi Publications		
Unit VI	Livestock Management	8	1.Economic Zoology: Shukla & Upadhyay		Dr. Sumallya Karmakar

Unit VII	Lac Culture	6	1.Economic Zoology: Shukla & Upadhyay		Dr. Sumallya Karmakar
Practical	Applied zoology	20	1. A.Sukla: A handbook of economic Zoology 2.Chaki, Kundu and Sarkar: Introduction to economic Zoology 3. Chaudhuri: Economic Zoology etc.	Photographs, chalk and talk and study materials	Dr. Debjani Das (Ghosh)
	1. Identification of various castes of honey bee, life cycle stages of <i>Bombyx mori</i>	4			
	Identification of life stages of Kerri lacca			Photographs, chalk and talk and study materials	Dr. Sumallya Karmakar
	Identification of earthworms used in vermiculture	**			Dr. Sucharita Saha
	Identification of ectoparasites of Poultry birds			Photographs, chalk and talk and study materials	Dr. Sumallya Karmakar
	2. Identification of the following fish and prawn specimens (specimen characters only): <i>Labeo rohita</i> , <i>Catla catla</i> , <i>Cirrhinus mrigala</i> , <i>Cyprinus carpio</i> , <i>L. bata</i> , <i>Penaeus monodon</i> , <i>Macrobrachium rosenbergi</i>	4	Ghosh, K.C., Manna, B.-- Practical Zoology, NCBA	1.Chalk and talk 2. Jar specimen display	Dr. Sucharita Saha

	3. Collection of any two pests and submission of specimens along with a report	10	1. Economic Zoology: Shukla & Upadhyay 2. Review papers & journals available at Internet and Research Institutes	1. Chalk & Talk method 2. Power Point presentation 3. Use of Charts, microscopes	Dr. Patralekha Mukhopadhyay
	4. Visit to any farm of economic importance and submission of report on the visit	12	1. Depending on the visit study materials to be provided 2. Review papers & journals available at Internet and Research Institutes	1. Chalk & Talk method 2. Field visit 3. Use of Computers & LCD projector	Dr. Patralekha Mukhopadhyay/ Dr. Sucharita Saha/ Dr. Debjani Das Ghosh

LESSON PLAN
DEPARTMENT: ZOOLOGY

NAME OF FACULTY: DR. PATRALEKHA MUKHOPADHYAY, DR. SUCHARITA SAHA, DR. DEBJANI DAS (GHOSH), DR. SUMALLYA KARMAKAR
SEMESTER-II

Subject: Zoology /IDC

Paper: Interdisciplinary Course (Animal Biology)-IDC-2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	Animal Diversity	10	Chaki, K.C., Kundu, G. and Sarkar, S. (2005). Introduction to General Zoology, New Central Book Agency (P) Ltd. Vol-1, Chapter-1.	1.Chalk and talk 2. Link share	Dr. Sucharita Saha
	Phylum Characters and examples of Cnidaria, Ctenophora, Mollusca and Echinodermata	5			
	Phylum Characters and examples of Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Chordata	5	1.Introduction to General Zoology: Vol I & II: Sarkar, Kundu, Chaki	1. Chalk & Talk method 2. Use of Charts, preserved specimens	Dr. Patralekha Mukhopadhyay
Unit 2	Genetics	12			Dr. Sumallya Karmakar

	<p>1. Mendelian Principles and Laws of inheritance</p> <p>2. Linkage and Recombination basic Concepts</p> <p>3. Sex Determination with reference to Drosophila [only genic balance theory]</p> <p>4. Chromosomal Aberration [Structural and Numerical]</p>		<p>Snustad D P, Simmons MJ. 2009. Principles of Genetics. V Edition. John Wiley and Sons Inc</p> <p>Strickberger M. W – Genetics; Macmillam</p>	1. Chalk & Talk method	
Unit 3	Biodiversity and Wildlife	15			
	<p>1. Biodiversity: Definition, Types and Value</p> <p>2. Indices (Shannon and Simpson)</p>	8	<p>1. Sharma, P.D. (2001). Ecology and Environment. Rastogi Publications</p> <p>2. https://www.worldwildlife.org/page</p>	<p>1. Chalk and talk</p> <p>2. Link share</p>	Dr. Sucharita Saha
	<p>3. Conservation :in-situ and ex-situ</p> <p>4. Conservation priority: Hotspot, Megadiversity, sensitive ecosystem</p>	<p>3</p> <p>3</p>	<p>1. G.K Saha and S Majumdar: Threatened mammals of India,</p> <p>2. G.K Saha and S Majumdar: Wildlife Biology,</p> <p>3. Wilson: Biodiversity,</p> <p>4. Sidhi and Ehlich: Conservation Biology for all etc</p>	<p>1. Photographs</p> <p>2. Chalk and talk</p> <p>3. Study materials</p>	Dr. Debjani Das (Ghosh)
	5. Indigenous knowledge and PBR: Basic concept	1	https://Byjus.com/free-ias-prep/peoples-biodiversity-register-pbr-upsc-notes/		Dr. Sucharita Saha

Unit 4	Insect vectors	8			
	1. Concept of vector: Biological and mechanical vectors with examples	2	1. Noble and Noble: Parasitology: The biology of animal parasites 2. Chapman: The insects: structure and function etc.	1. Photographs 2. Chalk and talk 3. Study materials	Dr. Debjani Das(Ghosh)
	2. Disease cycle & Reservoir Concept	1	1. Medical Entomology: Hati, A.K. 2. Introduction to General Zoology: Vol II: Sarkar, Kundu, Chaki	1. Chalk & Talk method 2. Use of Charts, preserved specimens	Dr. Patralekha Mukhopadhyay
	3. Life cycle, control, role as vector of <i>Anopheles</i> and <i>Aedes</i>	5			
Unit 5	Laboratory techniques and Instrumentation	5			
	1. Basics of Light Microscopy	2	Raghava, N. and Rabindra ,P.R. Biophysical methods tools and techniques in Biology, Part-1 Microscopy. Notion Pres	1. Chalk and talk 2. Link share	Dr. Sucharita Saha
	2. Principles and Application of Colorimetry	2	ABSORPTIOMETRY AND "COLORIMETRIC ANALYSIS": H.N. Wilson	Hands on experiment and reference materials	Dr. Debjani Das (Ghosh)
	3. Principles and Application of Ultracentrifugation				Dr. Sumallya Karmakar
Practical	Animal Biology	20			

	1.Karyotype analysis of Klinefelter, Down,Turner, Edward & Patau Syndrome	2	Concepts of Genetics	Photographs, chalk and talk and study materials	Dr. Sumallya Karmakar
	2.Identification of specimens: <i>Amoeba, Paramecium, Taenia,Ascaris, Nereis, Pheretima, Penaeus, Macrobrachium, Musca, Anopheles, Culex</i>	6	1. Practical Zoology: Ghosh K.C., Manna B. 2.An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Das S.K. 3. Practical Zoology: Chatterjee A.K., Chakraborty C.	1. Chalk & Talk method 2. Use of Charts, preserved specimens, permanent slides, microscopes	Dr. Patralekha Mukhopadhyay
	Identification of specimens: <i>Sycon, Neptune's cup,Pila, Lamellidens, Asterias</i>	6	1. Practical Zoology: Ghosh K.C., Manna B. 2.An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Das S.K.	1.Chalk and talk 2. Jar specimen display	Dr. Sucharita Saha
	3. Local-Outdoor trip for biodiversity	6	1. Books on Biodiversity 2.Review papers & journals available at Internet 3.Depend on the field trip study materials to be provided	1.Chalk & Talk method 2.Field visit 3.Use of Computers & LCD projector	Dr. Patralekha Mukhopadhyay/ Dr. Sucharita Saha/ Dr. Debjani Das (Ghosh)

LESSON PLAN

DEPARTMENT NAME: ZOOLOGY

NAME OF FACULTY: DR. PATRALEKHA MUKHOPADHYAY, DR. SUCHARITA SAHA & DR. DEBJANI DAS (GHOSH)

SEMESTER-IV

Subject: Zoology Hons. /ZOOA

Paper: Comparative Anatomy of Vertebrates : CC4-8

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	Integumentary System	10	1.Introduction to General Zoology: Vol I & II: Sarkar, Kundu, Chaki 2. Comparative anatomy of vertebrates; Sreejita Dias 3. Biology of animals: Vol II: Sinha A.K.,Adhikari S., Ganguly B.B.	1.Chalk & Talk method 2. Use of charts,LCD projector	Dr. Patralekha Mukhopadhyay
	1.Histological organization of skin of Amphibians and mammals	4			
	2. Mucous and poison glands in amphibians	2			
	3. Uropygeal and salt glands in birds	2			
	4. Sweat and sebaceous glands in mammals	2			
Unit 2	Digestive System	6	1.Introduction to General Zoology: Vol I & II: Sarkar, Kundu, Chaki 2. Comparative anatomy of vertebrates: Sreejata Biswas 3. Biology of animals: Vol II: Sinha A.K.,Adhikari S., Ganguly B.B.	1.Chalk & Talk method 2. Use of charts,LCD projector	
	1.Ruminant stomach of <i>Bos</i> & Camel	3			
	2. Dentition in mammals	3			

Unit 3	Respiratory system Gill morphology in fish Air sacs in birds Lungs in mammals	6	1.Ganong’s Review of Medical Physiology.Mcgraw Hill 2.Guyton, A.C. and Hall, J.E. (2011). Textbook of medical Physiology.XII ed, saunder’s Company	Chalk and Talk, Link share	Dr Sucharita Saha
Unit 4	<u>Circulatory System</u> General plan of circulation Comparative account of heart and aortic arches	7	1.Fox et al: Endocrinology, 2. Jameson: Harrison's endocrinology etc.	Chalk and Talk, Reference Materials, Peer Teaching, PPT presentation	Dr. Debjani Das (Ghosh)
Unit 5	<u>Urinogenital System</u> Succession of kidney in different vertebrate groups Evolution of urino-genital ducts	5	1.Norris: Vertebrate endocrinology etc. 2.Guyton, A.C. and Hall, J.E. (2011). Textbook of medical Physiology.XII ed, Saunder’s Company	Chalk and Talk, Reference Materials, PPT presentation	Dr. Debjani Das (Ghosh)
Unit 6	Nervous System and sense organs	8	1.Ganong’s Review of Medical Physiology.Mcgraw Hill	Chalk and Talk, Link share	Dr Sucharita Saha

	Comparative account of brain in vertebrates Cranial nerves (origin and distribution only) Olfactory receptors in fishes Auditory receptors in human		2.Guyton, A.C. and Hall, J.E. (2011). Textbook of medical Physiology.XII ed, saunder's Company		
Unit 7	Skeletal System	8			
	Overview of axial and appendicular skeleton Limbs and girdles in Pigeon Jaw suspension in mammals				
Practical	Comparative Anatomy of vertebrates Lab	60	Practical Zoology by Chatterjee & Chakraborty 2)Practical Zoology by Ghosh Manna 3)Laboratory Manual by Poddar	Chemicals & lab apparatus	Suchona Chakraborty
	1.Study of scales of fishes	10			
	2. Study of disarticulated skeleton of toad, pigeon & guineapig	24	1. Practical Zoology: Ghosh K.C., Manna B. 2.An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Dias S.K.	1.Chalk & Talk method 2. Use of Articulated and disarticulated skeletons	Dr. Patralekha Mukhopadhyay
	3. Comparative study of heart and brain	20	1.Biology of Animals: sinha, Adhikari, Ganguly, Bharati Goswami. Vol. II. NCBA	1. Chalk and Talk method 2. Use of models and photographs 3. Use of video clips	Dr Sucharita Saha

	4. Identification of skulls: Pigeon, Guinea pig & Dog	6	1. Practical Zoology: Ghosh K.C., Manna B. 2. An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Dias S.K.	1. Chalk & Talk method 2. Use of Articulated and disarticulated skeletons	Dr. Patralekha Mukhopadhyay
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LESSON PLAN

DEPARTMENT NAME: ZOOLOGY

NAME OF FACULTY: SUCHONA CHAKRABORTY

SEMESTER-IV

Subject: Zoology Hons. /ZOOA

Paper: Animal Physiology : CC4-9

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	Physiology of Digestion	10	1. Textbook on Medical physiology by Guyton & Hall 2. Review of Medical Physiology by Ganong 3. Animal Physiology by Dr.Vasantika Kashyap	1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
	Structure of GI tract	3			
	Function of GI tract	3			
	Mechanical & chemical digestion	3			
	Absorption	1			
Unit 2	Physiology of respiration				
	Mechanism	2			
	Respiratory volume & capacity	2			

	Transport of O ₂ & CO ₂	2			
	Dissociation curve	2			
	Respiratory pigments	1			
	CO poisoning	1			
Unit 3	Physiology of Circulation	8			
	Structure & function of hemoglobin	2			
	Blood clotting	2			
	Haematopoiesis	2			
	Blood group	2			
Unit 4	Physiology of Heart	8			
	Coronary circulation	2			
	Structure & function of myocardial fibre	2			
	Cardiac impulse	2			
	Cardiac cycle	2			
Unit 5	Thermoregulation & Osmoregulation	6			
	Thermoregulation in camel & polar bear	3			

	Osmoregulation in aquatic vertebrate	3			
Unit 6	Renal Physiology	8			
	Structure of kidney & its functional unit	3			
	Mechanism of urine formation	3			
	Regulation of acid base balance	2			
Practical	Animal Physiology Lab	60			
	1.Determination of ABO blood group	4	1. Practical Zoology: Ghosh K.C., Manna B. 2.An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Dias S.K. 3. Practical Zoology: Chatterjee A.K., Chakraborty C.	1.Chalk & Talk method 2. Use of staining sets, microscopes 3. Use of Blood group kit	Dr. Patralekha Mukhopadhyay
	2.Estimation of haemoglobin by Sahil's haemoglobino meter	5	Practical Zoology by Chatterjee & Chakraborty 2)Practical Zoology by Ghosh Manna 3)Laboratory Manual by Poddar	Chemicals & lab apparatus	Suchona Chakraborty

	3. Identification of blood cells from human blood	4	1. Practical Zoology: Ghosh K.C., Manna B. 2. An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Dias S.K. 3. Practical Zoology: Chatterjee A.K., Chakraborty C.	1. Chalk & Talk method 2. Use of staining sets, microscopes 3. Use of Blood group kit	Dr. Patralekha Mukhopadhyay
	4. Preparation of haemin crystals and haemochromogen crystals				
	5. Identification of blood cells from cockroach haemolymph				Dr. Sucharita Saha
	6. Demonstration of blood pressure by digital meter	5	Practical Zoology by Chatterjee & Chakraborty 2) Practical Zoology by Ghosh Manna 3) Laboratory Manual by Poddar	Chemicals & lab apparatus	Suchona Chakraborty

LESSON PLAN

DEPARTMENT NAME: ZOOLOGY

NAME OF FACULTY: DR. DEBJANI DAS (GHOSH)

SEMESTER-IV

Subject: Zoology Hons. /ZOOA

Paper: Immunology : CC4-10

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Overview of Immune System</u>	3	Abbas et al: Cellular and Molecular Immunology, Roitt's essential immunology, Kuby : Immunology etc. Shetty N: Immunology: Introduction	1.Chalk & Talk method 2. PPT	Dr. Debjani Das (Ghosh)
	Introduction-concept of health and disease Cells and organs of the Immune system				
Unit 2	Innate and Adaptive Immunity	9	Mohanty and Leela: Text book of Immunology	1.Chalk & Talk method 2. Use of charts,LCD projector	
	Anatomical barriers Inflammation Cells and molecules involved in Innate immunity Adaptive immunity				

Unit 3	<u>Antigens</u>	6		Chalk and Talk, Link share
	Antigenicity and Immunogenicity, Immunogens, Adjuvants and Haptens, Factors including Immunogenicity, B and T cell epitopes			
Unit 4	<u>Immunoglobulins</u>	10		Chalk and Talk, Reference Materials, PPT presentation
	Structure and functions of classes of immunoglobulins, Antigen-antibody interactions, Immunoassays(ELISA and RIA), Monoclonal antibody production			
Unit 5	<u>Major Histocompatibility Complex</u>	6	Chalk and Talk, Reference Materials, PPT presentation	
	Structure and functions of MHC molecules Structure of T cell Receptor and it's signaling, T cell development and selection			
Unit 6	<u>Cytokines</u>	3	Chalk and Talk,	

	Types, properties and functions of cytokines			Reference Materials, PPT presentation	
Unit 7	<u>Complements</u>	5			
	Components and pathways of complement activation				
Unit 8	<u>Hypersensitivity</u>	4		Chalk and Talk, Reference Materials, PPT presentation	
	Gell and Coombs' classification and brief description of various types of hypersensitivity				
Unit 9	<u>Vaccines</u>	4			
	Various types of vaccines, Active and passive immunization				

Practical	IMMUNOLOGY LAB	60	P. Madhavelatha: A textbook of Immunology,	Microscope, slides, photographs, Chemicals & lab apparatus
	1.Demonstration of lymphoid organs.	20	AK. Roy: Immunology, Khanna: Immunology, Kuby: Immunology,	
	2.Histological study of Bursa fabricius, spleen, thymus and lymph nodes through slides/ photographs	30	Khan: The elements of Immunology, Bhattacharya and Sinha: Textbook of Immunology	
	3.Demonstration of ELISA	10		

LESSON PLAN

DEPARTMENT NAME: ZOOLOGY

NAME OF FACULTY: DR. SUCHARITA SAHA

SEMESTER-IV

Subject: Zoology Hons. /ZOOA

Paper: Aquarium Fish Keeping: SEC (B)-4-1

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Introduction to aquarium fish keeping</u> The potential scope of aquarium fish industry as a cottage industry, exotic and endemic species of aquarium fishes	2	1.Pandey, K. and Shukla,J.P. (2013). Fish and Fisheries, Rastogi Publications 2.Saha, S. (2021). Concept of Aquarium Fish keeping. Techno World	Chalk and Talk, Link share	Dr. Sucharita Saha
Unit 2	<u>Biology of aquarium fishes</u> Common characters and sexual dimorphism of fresh water and marine aquarium fishes such as Guppy, molly, swordtail, gold fish, angel fish, blue morph, anemone fish and butterfly fish	10	3.Bailey, M. and Sandford, G. (2014). Aquarium Fish. Anness Publishing Ltd. Hermes House		

Unit 3	<u>Food and feeding of aquarium fishes</u> Use of live fish feed organisms, preparation and composition of formulated fish feed, aquarium fish as larval predator	8			
Unit 4	<u>Fish Transportation</u> Live fish transport-fish handling, packing and forwarding techniques	5			
Unit 5	<u>Maintenance of aquarium</u> General aquarium maintenance, Setting up an aquarium fish farm as a cottage industry	5			

LESSON PLAN

DEPARTMENT NAME: ZOOLOGY

NAME OF FACULTY: DR. SUMALLYA KARMAKAR

SEMESTER-IV

Subject: Zoology General/ZOOG

Paper: Genetics & Evolutionary Biology : CC4/GE4

Planned					
Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
1	Principles of Inheritance, Chromosome theory of inheritance, Incomplete dominance and codominance, Multiple alleles, lethal alleles, sex linked inheritance in Drosophila (White eye locus) & Human (Thalassemia).	Strickberger M. W – Genetics; Macmillan	08	ICT & Board works	
2	Linkage and crossing over, Complete & Incomplete Linkage, Recombination frequency as a measure of linkage intensity. Holiday Model		08	Board works	
3	Chromosomal mutation, Deletion, duplication, inversion, translocation, aneuploidy, gene mutation, induced mutation, types & example		08	ICT & Board works	

4	Genic Balance theory and dosage compensation in Drosophila	Organic Evolution by Dr. Veer Bala Rastogi	04	Board works	
5	Chemical Origin of life		04	ICT & Board works	
6	Lamarckism, Darwinism, Neo-Darwinism.		06	Board works	
7	Isolating mechanism, Natural Selection		04	Board works	
8	Sympatric, Allopatric, Parapatric		04	ICT & Board works	

Subject: Zoology General/ZOOG

Paper: Genetics & Evolutionary Biology : CC4/GE4 PR

Planned					
Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
1	Verification of Mendelian Ratio using Chi square test.	Strickberger M. W – Genetics; Macmillam	02	Board work	
2	Identification of Human Aneuploidy using photograph of karyotype.		02	Board work	
3	Phylogeny of horse with diagram of limb and skull	Organic Evolution by Dr. Veer Bala Rastogi	02	Board work	

4	Study and identification of Darwin Finches from photographs		02	Board work	
5	Visit to natural history museum and submission of report		02	Field work	

LESSON PLAN

DEPARTMENT: ZOOLOGY

NAME OF FACULTY: DR. PATRALEKHA MUKHOPADHYAY

SEMESTER-VI

Subject: Zoology Hons. /ZOOA

Paper: Developmental Biology: CC-6-13

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	Early development	20	1.Developmental Biology: Gilbert S.F. 2. Introduction to General Zoology: Vol I: Sarkar, Kundu, Chaki	1.Chalk & Talk method 2. Use of charts, LCD projector 3.Power Point Presentation	Dr. Patralekha Mukhopadhyay
	1.Gametogenesis in sea urchin and mammal	4			
	2. Types of eggs and egg membranes	2			
	3. Fertilization in sea urchin and mammal	2			
	4. Planes and patterns of cleavage	2			
	5. Blastula of frog and chick	2			
	6. Fate map in chick embryo	2			
	7. Gastrulation in frog and chick	4			
	8. Embryonic induction and organizers with Spemann & Mangold's experiment	2			

Unit 2	Late Embryonic development	16	1.Developmental Biology: Gilbert S.F. 2. Introduction to General Zoology: Vol I : Sarkar, Kundu, Chaki		
	1.Extra-embryonic membranes in chick	6			
	2. Implantation of embryo in human	4			
	3. Structure, types and functions of placenta	6			
Unit 3	Post embryonic Development	8	1.Developmental Biology: Gilbert S.F. 2. Introduction to General Zoology: Vol I : Sarkar, Kundu, Chaki		
	1.Development of brain and eye in chick	4			
	2. Molecular induction in brain and eye development	4			
Unit 4	Implication of Developmental Biology	6	1.Developmental Biology: Gilbert S.F.		
	1.IVF 2.Stem cell concept	2 4			
Practical	Developmental Biology Lab	30	1. Practical Zoology: Ghosh K.C., Manna B. 2.An advanced Laboratory Manual of Zoology: Poddar T., Mukhopadhyay S., Dias S.K. 3. Practical Zoology: Chatterjee A.K., Chakraborty C.	1.Chalk & Talk method 2. Use of microscopes 3. Use of permanent microscopic slides,charts	

	<p>1. Study of 24,48,72 and 96 hrs of chick embryo</p> <p>2. Study of developmental stages and life cycle of Drosophila</p> <p>3. Study of histological sections of placenta</p> <p>4. Identification of Invertebrate larva of Phylum Annelida, Arthropoda, Mollusca and Echinodermata</p>	<p>4</p> <p>4</p> <p>4</p> <p>6</p>			
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LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: SUCHONA CHAKRABORTY & DR. SUMALLYA KARMAKAR
SEMESTER-VI

Subject: Zoology Hons. /ZOOA

Paper: Evolutionary Biology: CC-6-14

Subject : Zoology Hons

Paper : Core Course (Evolutionary Biology) - CC- 14

Planned				After Implementation		
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments	
Unit 1	Origin of life	3	1.Organic Evolution by Dr. Veer Bala Rastogi 2. Organic Evolution by Tomar & Singh 3. Evolution by Strickberger	1. Class lecture	Suchona Chakraborty	
	RNA world hypothesis	2				
Unit 2	Lamarkism	2		2. Organic Evolution by Tomar & Singh		2.PDF
	Darwinism , Neo –Darwinism	3				
Unit 3	Geological time scale	2		3. Evolution by Strickberger		3.Reference Notes
	Fossil	2				
	Evolution of horse	2				
Unit 4	Natural selection	6				
Unit 5	Species concept	2				

	Isolation	3			
	Speciation	2			
	Adaptive radiation	3			
Unit 6	Evolution of man	2			
Unit 7	Population genetics: Hardy-Weinberg Law; factors disrupting H-W equilibrium (Genetic Drift, Migration and Mutation and Selection in changing allele frequencies (only derivations required). Simple problems related to estimation of allelic and gene frequencies.	10	Organic Evolution by Dr. Veer Bala Rastogi		Dr. Sumallya Karmakar
Unit 8	Extinction	1	1.Organic Evolution by Dr. Veer Bala Rastogi	1. Class lecture	Suchona Chakraborty
Unit 9	Phylogenetic tree	2	2. Organic Evolution by Tomar & Singh 3. Evolution by Strickberger	2.PDF 3.Reference Notes	
Practical	Study of Fossil	14	Reference notes	1.Class lecture 2. Picture Slides 3.Reference Notes 4. Videos	Suchona Chakraborty
	Study of homology & analogy	6			
	Parsimony & Dendrogram	10			

LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. SUMALLYA KARMAKAR
SEMESTER-VI

Subject: Zoology Hons. /ZOOA

Paper: Animal Biotechnology: DSE (A)-6-2

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
1	Organization of E.coli and Drosophila genome	Atlas R. M. and R. Bartha – Microbial Ecology : Fundamentals and Applications Thieman W.J. and M.A. Palladino – Introduction to Biotechnology; Pearson	4	ICT & Chalk board	
2	Recombinant DNA technology, Restriction endonucleases.		5	ICT & Chalk board	
	Cloning Vectors & their features: Plasmids, Phage vectors, Cosmids, Phagemids, BAC, YAC, and HAC. Shuttle and Expression Vectors.		5	ICT & Chalk board	
	Construction of Genomic libraries and cDNA libraries		3	ICT & Chalk board	
	Transformation techniques: Cloning in bacteria and detection technique of clone		5	ICT & Chalk board	
	Agarose and Polyacrylamide Gel Electrophoresis, Southern, Northern and Western blotting, Polymerase chain reaction: Allele specific, RAPD & RT PCR, DNA Fingerprinting		5	ICT & Chalk board	

3	Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection.		6	ICT & Chalk board	
	Applications of transgenic animals: Production of pharmaceuticals, production of donor organs, knock-out mice		6	ICT & Chalk board	
4	Animal cell culture, Expressing cloned genes in mammalian cells, Molecular diagnosis of genetic diseases (Cystic fibrosis, Sickle cell anaemia, Thalassemia). Dolly & Polly cloning		5	ICT & Chalk board	
	Genetically modified economically important animal		2	ICT & Chalk board	
	Gene Therapy		3	ICT & Chalk board	

Paper: Animal Biotechnology: DSE (A)-6-2- PR

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
	Genomic DNA isolation from E. coli and Plasmid DNA isolation (pUC 18/19) from E. coli		3	Hands-on	
	To study following techniques through photographs - Southern Blotting, Northern Blotting, Western Blotting, PCR, DNA fingerprinting		3	ICT	

	Project report on animal cloning & Application & ethical Issues.				
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LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. DEBJANI DAS GHOSH
SEMESTER-VI

Subject: Zoology Hons. /ZOOA

Paper: Animal Behaviour and chronobiology: DSE (B)-6-1

Planned			After Implementation		
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Patterns of Behavior</u>	10	Alcock: Animal Behavior, Drickamer:: Animal Behavior, Dujatkin: Principles of Animal Behavior, Mathur R: Animal behavior	1.Chalk & Talk method 2. PPT 3. Reference materials 4. Peer teaching 5.Group discussion	Dr. Debjani Das (Ghosh)
	Stereotyped Behaviour,; Individual behavioral patterns; Instinct vs learned behavior; FAP, Associative Learning, Classical and operant conditioning; Habituate, Imprinting				
Unit 2	<u>Social and Sexual Behavior</u>	20			

	<p>Social organization in Termites, Communication (dance and pheromones in Bees), Social behavior: ALTRUISM, Cooperation and Selfishness; Sexual Behavior: Sexual dimorphism, mate choice in peacock, intra-sexual selection (male rivalry in red Deer) ;</p> <p>Ki shop theory: Related news and inclusive fitness; parental care in fishes(Nest building and cost benefit) ; conflict within families: parent offspring conflict and sibling rivalry</p>				
Unit 3	<p><u>Chronobiology and Biologist Rhythm</u></p> <p>Types and characteristics of biological rhythms:short and long term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms, Circannual rhythms; Photos and nonphotic zeitgebers; Role of melatonin. Biological clock and its adaptive significance. Circannual rhythms in bird migration.</p>	20			
Practical	<p><u>Animal behavior and chronobiology lab</u></p>	60	Sherman, Alcock: Exploring		

	1.To study nests and nesting habits of the birds and social insects.	5	Animal Behavior, Mandal: A textbook of Animal Behavior		
	2. To study the behavioral responses of woodlice to dry and humid conditions.	5			
	3. To study geotaxis behavior in earthworms.	5			
	4.To study the phototaxis behavior in earthworms.	5			
	5. Visit to Forest/ Wildlife Sanctuary/ Biodiversity park/ Zoological park to study behavioral activities of animals and prepare a short report.	35			

	6.Study of circadian functions in humans(daily eating, sleep and temperature patterns).	5			
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LESSON PLAN
DEPARTMENT: ZOOLOGY
NAME OF FACULTY: DR. SUCHARITA SAHA
SEMESTER-VI

Subject: Zoology General/ZOOG

Paper: Ecology and Wildlife Biology: DSE (B)-6-2

Planned				After Implementation	
Unit / Group / Module / Article	Topics	No of Lecture Planned	Reference Books	Content Delivery Technique	Remarks / Comments
Unit 1	<u>Introduction to Ecology</u> Ecosystem, Autecology and synecology, levels of organization, laws of limiting factors, Study of Physical factors, the Biosphere	4	1. Roy, M. (2018). Perspectives in Ecology, Kalyani Printings, ISBN: 978-93-272-9087-5	Chalk and Talk, Link share	Dr. Sucharita Saha

Unit 2	<u>Population</u> Attributes of population : life tables, fecundity tables, Survivorship curves, dispersal and dispersion Growth patterns and equations: Exponential and logistic growth Population regulation: Density-dependent and independent factors	20			
Unit 3	<u>Community</u> Community characteristics: species diversity, abundance, dominance, vertical stratification Ecotone and edge-effect	11			

Unit 4	<u>Ecosystem</u> Types of ecosystem with an example in details Food-chain : Definition and types-detritus and grazing food-chain, Linear and Y-shaped food-chains Food-web: Definition and types Energy flow: Models of energy flow Ecological pyramids: definition, Types with examples Ecological efficiencis	10			
Unit 5	<u>Wildlife</u> Necessity of wild life conservation Wild-life conservation (in-situ and ex-situ) Concept of protected areas : National parks and Sanctuaries Tiger conservation-Tiger reserves in India, management and challenges in Tiger reserves	5			

Practical	a) Identification of flora, mammalian fauna, avian fauna	10	<ol style="list-style-type: none"> Ghosh, K.C., Manna, B.-- Practical Zoology, NCBA Roy, M. (2018). Perspectives in Ecology, Kalyani Printings, ISBN: 978-93-272-9087-5 	Chalk and talk, Specimen and instrument display, photograph display	Dr. Sucharita Saha
	b) Demonstration of basic equipments needed in wild life study, their use, care and maintenance (compass, binoculars, spotting scope, range finders, Global Positioning system, various types of cameras and lenses)	10			
	c) Familiarisation and study of animal evidences in the field; identification of animals through pug marks, hoof marks, scats, pellet groups, nests, antlers etc.	10			
	d) Study of an aquatic ecosystem : Phytoplanktons and Zooplanktons, Measurement of area, temperature, salinity	30			
	e) determination of pH and dissolved oxygen content (Winkler's method), chemical oxygen demand and free carbon-di-oxide				
			<ol style="list-style-type: none"> Display of photographs for planktons Graphimetric method for area calculation Titrimetric method for water quality 		

LESSON PLAN

DEPARTMENT: ZOOLOGY

NAME OF FACULTY: DR. SUCHARITA SAHA, DR.DEBJANI DAS (GHOSH), Suchona Chakraborty

SEMESTER-VI

Subject: Zoology General/ZOOG

Paper: Medical diagnostics: Sec-B-1

<u>Planned</u>				<u>After Implementation</u>	
<u>Unit / Group / Module / Article</u>	<u>Topics</u>	<u>No of Lecture Planned</u>	<u>Reference Books</u>	<u>Content Delivery Technique</u>	<u>Remarks / Comments</u>
<u>Unit 1</u>	<u>Diagnostic methods used for analysis of Blood</u>	<u>8</u>			
<u>Unit 2</u>	<u>Diagnostic methods used for urine analysis</u> Physical characteristics, Abnormal constituents, Urine culture	4		Chalk and Talk, Link share	Dr. Sucharita Saha
<u>Unit 3</u>	<u>Non-infectious Diseases</u> Diabetes (Type-I and Type -II); Hypertension, Testing of blood glucose using Glucometer /kit	6	MacFarlane S I and Bakris G L: Diabetes and Hypertension: Evaluation and Management Mishra A: Diabetes with delight	Chalk and Talk, Lecture materials and Reference materials	Dr. Debjani Das (Ghosh)

Unit 4	<u>Infectious Disease</u> Tuberculosis, Hepatitis, Malaria	3		1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
Unit 5	<u>Clinical Biochemistry</u> Lipid profiling, Liver function test, PSA test	1		Chalk and Talk, Link share	Dr. Sucharita Saha
Unit 6	<u>Clinical Microbiology</u> Anbiotic Sensitivity Test	1		1.Class lecture 2.PDF 3.Reference Notes	Suchona Chakraborty
Unit 7	<u>Tumors</u>	2	Weinberg R A. 2014. Biology of Cancer. 2 nd edition. Garland Science, Taylor & Francis		Dr. Sumallya Karmakar
Unit 8	Visit to Pathological Lab	5			Suchona Chakraborty