

**TEACHING PLAN**  
**Academic Session 2021-2022**  
**Under CBCS System**  
**Semester 1(July-December)**  
**CC – 1**  
**CORE COURSE 1. Non-Chordates I**

<b>ZOOA-CC1-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Basics of Animal Classification</b>	SP		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Protista and Metazoa</b>	SB		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Porifera</b>	GH		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Cnidaria</b>	GH		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Ctenophora</b>	GH		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Platyhelminthes</b>	SB		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Nematoda</b>	SB		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Non-Chordates I Lab; ZOOA-CC-1-1-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of whole mount of Euglena, Amoeba and Paramoecium</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification with reason &amp; Systematic position of Amoeba, Euglena, Entamoeba, Paramecium, Plasmodium, Balantidium, Vorticella (from the prepared slides)</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification with reason &amp; Systematic position of Sycon, Poterion (Neptune's Cup), Obelia, Physalia, Aurelia, Gorgonia, Metridium, Pennatula, Madrepora, Fasciola hepatica, Taenia solium and Ascaris lumbricoides.</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Staining/mounting of any protozoa/ helminth from gut of Periplaneta sp.</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos

**Total Marks -30**

**CC – 2**  
**CORE COURSE 2: Molecular Biology**

<b>ZOOA-CC1-2-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Nucleic Acids</b>	SK	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: DNA Replication</b>	SK	9	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Transcription</b>	DG	9	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Translation</b>	DG	9	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Gene Regulation</b>	SK	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: DNA Repair Mechanisms</b>	SK	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Molecular Techniques</b>	SK	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Molecular Biology Lab; ZOOA-CC-1-2-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Demonstration of polytene and lampbrush chromosome from photograph</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Isolation and quantification of genomic DNA from goat liver</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Agarose gel electrophoresis for DNA.</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Histological staining of DNA and RNA in prepared slides</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos

**CBCS System**  
**Semester 2(January-June)**  
**CC – 3**

**CORE COURSE 3: Non-Chordates II – Coelomates**

ZOOA-CC-2-3-TH	Teacher	Class Hour	Teaching Method	
Unit 1: Introduction	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 2: Annelida	SB	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 3: Arthropoda	GH	16	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 4: Onychophora	SB	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 5: Mollusca	SP	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 6: Echinodermata	SB	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Unit 7: Hemichordata	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test	
Total Marks -50				
Non-Chordates II Lab, ZOOA-CC-2-3-P	Teacher	Class Hour	Domain	Teaching Method
Study of following specimens:Annelids - Aphrodite, Nereis, Chaetopterus, Earthworm, Hirudinaria	SB	10		Practical demonstration with hands on activity, powerpoint presentation and videos
Study of following specimens:Arthropods - Limulus, Palaemon, Balanus, Eupagurus, Scolopendra, Peripatus, Silkworm – life history stages, Termite – members of a colony and Honey bee – members of the colony	SB	10		Practical demonstration with hands on activity, powerpoint presentation and videos
Study of following specimens:Molluscs - Dentalium, Patella, Chiton, Pila, Achatina, Pinctada, Sepia, Octopus, Nautilus	SB	10		Practical demonstration with hands on activity, powerpoint presentation and videos

<b>Study of following specimens: Echinoderms - Asterias, Ophiura, Clypeaster, Echinus, Cucumaria and Antedon</b>	<b>SB</b>	<b>10</b>		<b>Practical demonstration with hands on activity, powerpoint presentation and videos</b>
<b>Anatomy study: Nervous system, Reproductive system (Male &amp; female), Mouth parts &amp; Salivary apparatus in Periplaneta sp.</b>	<b>SP</b>	<b>10</b>		Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>				

#### **CC-4 (Semester 2)**

#### **CORE COURSE 4: Cell Biology**

<b>ZOOA-CC2-4-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Plasma Membrane</b>	DG	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Cytoplasmic organelles I</b>	SB	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Cytoplasmic organelles II</b>	DG	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Cytoskeleton</b>	GH	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Nucleus</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Cell Cycle</b>	SK	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Cell Signalling</b>	SK	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Cell Biology Lab; ZOOA-CC-2-4-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Preparation of temporary stained squash of onion/arum root tip to study various stages of mitosis</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos

<b>Study of various stages of meiosis from grasshopper testis</b>	<b>SB</b>	<b>10</b>	<b>Practical demonstration with hands on activity, powerpoint presentation and videos</b>
<b>Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.</b>	<b>SK</b>	<b>10</b>	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Preparation of permanent slide to demonstrate:</b> <b>a. DNA by Feulgen reaction</b> <b>b. Cell viability study by Trypan Blue staining</b>	<b>SK</b>	<b>10</b>	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

### CC-5 (Semester 3)

#### CORE COURSE 5: Chordata

<b>ZOOA-CC3-5-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Chordates</b>	<b>SB</b>	<b>2</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Protochordata</b>	<b>SB</b>	<b>7</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Agnatha</b>	<b>SB</b>	<b>2</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Pisces</b>	<b>SB</b>	<b>7</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Amphibia</b>	<b>SB</b>	<b>7</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Reptilia</b>	<b>DG</b>	<b>8</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Aves</b>	<b>DG</b>	<b>8</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Mammals</b>	<b>DG</b>	<b>9</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			

<b>Chordata Lab; ZOOA-CC-3-5-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Identification with Reasons</b> <b>a) Protochordata: Balanoglossus, Branchiostoma</b> <b>b) Agnatha: Petromyzon</b> <b>c) Fishes: Scoliodon, Sphyrna, Pristis, Torpedo, Mystus, Heteropneustes, Labeo rohita, Exocoetus, Hippocampus, Anabas, Flat fish</b> <b>d) Amphibia: Necturus, Bufo (Duttaphrynus) melanostictus, Rana (Hoplobatrachus) tigerinus, Hyla, Tylotriton, Axolotl larva</b> <b>e) Reptilia: Chelone, Trionyx, Varanus, Hemidactylus, Calotes, Chamaeleon, Draco, Vipera, Naja, Hydrophis,</b> <b>f) Mammalia: Bat (Insectivorous and Frugivorous), Funambulus (Indian Palm squirrel)</b>	SB	30	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Dissection of brain and pituitary – ex situ, digestive and Urino-genital system of Tilapia</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Pecten from Fowl head</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Power point presentation on study of habit, habitat or behaviour of any one animal by student – for internal assessment only</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

### CC-6 (Semester 3)

#### CORE COURSE 6: Animal Physiology: Controlling and Co-ordinating System

<b>ZOOA-CC3-6-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Tissues</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Bone and Cartilage</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Nervous System</b>	SK	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test

<b>Unit 4: Muscular system</b>	SK	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Reproductive System</b>	SK	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Endocrine System</b>	SP	16	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Animal Physiology: Controlling &amp; Coordinating Systems, Lab; ZOOA-CC3-6-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Recording of cardiac and simple muscle twitch with electrical stimulation</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of permanent slides of Mammalian Skin, Spinal cord, Pancreas, Testis, Ovary, Adrenal, Lung, pyloric stomach, cardiac stomach, Thyroid, small intestine and large intestine of mammal (white rat)</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Microtomy: Preparation of permanent slide of any five mammalian (Goat/white rat) tissues</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC-7 (Semester 3)**  
**CORE COURSE 7: Fundamentals of Biochemistry**

<b>ZOOA-CC3-7-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Carbohydrates</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Lipids</b>	GH	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Proteins</b>	GH	10	Lecture method using books, powerpoint presentation, videos,

			group discussion and class test
<b>Unit 4: Nucleic Acids</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Enzymes</b>	DG	13	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Oxidative Phosphorylation</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Fundamentals of Biochemistry Lab; ZOOA-CC-7-3-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Qualitative tests for carbohydrates, proteins and lipids</b>	GH	30	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Qualitative estimation of Urea &amp; Uric acid</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Paper chromatography of amino acids</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Quantitative estimation of water soluble proteins following Lowry Method</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

#### CC-8 (Semester 4)

#### CORE COURSE 8.Comparative Anatomy of Vertebrates

<b>ZOOA-CC4-8-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Integumentary System</b>	SK	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Digestive System</b>	SK	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Respiratory System</b>	SK	6	Lecture method using books, powerpoint presentation, videos,



			group discussion and class test
<b>Unit 4: Circulatory System</b>	SK	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Urinogenital System</b>	SP	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Nervous system and sense organs</b>	SP	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Skeletal system</b>	SP	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Comparative Anatomy of Vertebrates Lab; ZOOA-CC4-8-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of placoid, cycloid and ctenoid scales through permanent slides/photographs</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of disarticulated skeleton of toad, Pigeon, Guineapig (limb bones, vertebrae, limb and girdle)</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Comparative study of heart and brain, with the help of model/picture</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of skulls: Pigeon, one herbivore (Guineapig) and one carnivore (Dog) animal</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

#### CC-9 (Semester 4)

#### CORE COURSE 9: Animal Physiology: Life Sustaining Systems

<b>ZOOA-CC4-9-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Physiology of Digestion</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Physiology of Respiration</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test

<b>Unit 3: Physiology of Circulation</b>	<b>GH</b>	<b>8</b>	<b>Lecture method using books, powerpoint presentation, videos, group discussion and class test</b>
<b>Unit 4: Physiology of Heart</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Thermoregulation &amp; Osmoregulation</b>	GH	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Renal Physiology</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Animal Physiology: Life Sustaining Systems Lab; ZOOA-CC4-9-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Determination of ABO Blood group</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Estimation of haemoglobin using Sahli's haemoglobin meter</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of blood cells from human blood</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Preparation of haemin crystals and haemochromogen crystals</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of blood cells from cockroach haemolymph</b>	GH	5	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Demonstration of blood pressure by digital meter</b>	GH	5	Practical demonstration with hands on activity, powerpoint presentation and videos

**CC-10 (Semester 4)**  
**CORE COURSE 10: Immunology**

<b>ZOOA-CC4-10-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Overview of Immune System</b>	SB	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Innate and Adaptive Immunity</b>	SB	9	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Antigens</b>	SB	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Immunoglobulins</b>	SB	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Major Histocompatibility Complex</b>	SB	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Cytokines</b>	DG	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Complement System</b>	DG	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Hypersensitivity</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Vaccines</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Immunology Lab; ZOOA-CC4-10-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Demonstration of lymphoid organs (by picture)</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Histological study of Bursa fabricius, spleen, thymus and lymph nodes through slides/photographs</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Demonstration of ELISA</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC-11 (Semester 5)**  
**CORE COURSE 11.Ecology**

<b>ZOOA-CC5-11-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Ecology</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Population</b>	SB	20	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Community</b>	SP	11	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Ecosystem</b>	SP	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Applied Ecology</b>	SP	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Ecology Lab, ZOOA-CC5-11-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method) Chemical Oxygen Demand and free CO<sub>2</sub></b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Report on a visit to National Park/Biodiversity Park/Wild life sanctuary/ any place of ecological interest/ ecological uniqueness/ Zoological garden</b>	SB	30	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC-12 (Semester 5)**  
**CORE COURSE 12.Principle of Genetics**

<b>ZOOA-CC5-12-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Mendelian Genetics and its Extension</b>	SK	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Linkage, Crossing Over and Linkage Mapping</b>	SK	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Mutations</b>	SK	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Sex Determination</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Extra-chromosomal Inheritance</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Genetic Fine Structure</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Transposable Genetic Elements</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Principles of Genetics Lab, ZooA-CC5-12-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Chi-square analyses for genetic ratio test</b>	GH	20	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of chromosomal aberration in Drosophila and man from photograph</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Pedigree analysis of some inherited traits in animals</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC-13 (Semester 6)**  
**CORE COURSE 13: Developmental Biology**

<b>ZOOA-CC6-13-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Early Embryonic Development</b>	SB	20	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Late Embryonic Development</b>	SB	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Post Embryonic Development</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Implications of Developmental Biology</b>	GH	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Developmental Biology Lab; ZOOA-ZooA-CC6-13-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of whole mounts of developmental stages of chick embryo through permanent slides: 24, 48, and 96 hours of incubation</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of the developmental stages and life cycle of Drosophila</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of different sections of placenta (photomicrograph/ slides)</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of Invertebrate larva through slides/ photographs of Phylum Annelida, Arthropoda, Mollusca and Echinodermata</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC-14 (Semester 6)**  
**CORE COURSE 14.Evolutionary Biology**

<b>ZOOA-CC6-14-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Domain</b>	<b>Teaching Method</b>
<b>Unit 1: Origin of Life (Chemical basis), RNA world hypothesis</b>	SK	5		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Historical review of Evolutionary concepts: Lamarkism, Darwinism and Neo Darwinism</b>	SK	5		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Geological time scale, Fossil: types and age determination by Carbon dating, Evolution of horse</b>	GH	6		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Natural Selection: Modes with Examples</b>	GH	6		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Species concept, Isolating mechanisms, modes of speciation; Speciation by chromosome rearrangement in Drosophila. Adaptive radiation/macroevolution (exemplified by Galapagos finches).</b>	SK	10		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Origin and Evolution of Man, Unique Hominid characteristics contrasted with primate characteristic</b>	GH	2		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>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</b>	SK	10		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Extinction, back ground and mass extinctions, detailed example of K-T extinction</b>	GH	3		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Phylogenetic trees, construction and interpretation of Phylogenetic tree using parsimony, convergent and divergent evolution.</b>	GH	5		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>				

<b>Evolutionary Biology Lab, ZooA-CC6-14-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of fossils from models/ pictures: Dickinsonia, Paradoxides (Trilobita), Asteroceras (Ammonoid), Pentremites (Blastoid Echinoderm), Ichthyosaur, Archaeopteryx, Cynodont.</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of homology and analogy from suitable specimens.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Phylogenetic trees, Construction &amp; interpretation of Phylogenetic tree using parsimony, Construction of dendrogram following principles of phenetics &amp; cladistics from a data table</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

### **DSE-1 (Semester 5)**

#### **DSE1. Parasitology**

<b>ZOOA-DSE(A)-5-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Parasitology</b>	SB	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Parasitic Protists</b>	SB	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Parasitic Platyhelminthes</b>	SB	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Parasitic Nematodes</b>	SB	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Parasitic Arthropods</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Parasite Vertebrates</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			



<b>Parasitology Lab, ZOOA-DSE(A)-5-1-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of life stages of Giardia intestinalis, Trypanosoma gambiense, Leishmania donovani, Plasmodium vivax, Plasmodium falciparum through permanent slides/micro photographs</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of adult and life stages of Schistosoma haematobium, Taenia solium through permanent slides/micro photographs</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of adult and life stages of Ancylostoma duodenale through permanent slides/micro photographs</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of monogenea from the gills of fresh/marine fish [Gills can be procured from fish market as by product of the industry]</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of nematode/cestode parasites from the intestines of Poultry bird [Intestine can be procured from poultry/market as a by-product] &amp; Goat</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Submission of a brief report on parasitic vertebrates</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**DSE-1 (Semester 5)**  
**DSE1. Endocrinology**

<b>ZOOA-DSE(B)-5-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Endocrinology</b>	GH	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Hypothalamo-Hypophyseal Axis</b>	GH	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Peripheral Endocrine Glands</b>	SK	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Regulation of Hormone Action</b>	SK	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5. Non Mammalian Vertebrate Hormone</b>	GH	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			

<b>Endocrinology Lab, ZOOA-DSE(B)-5-1-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Dissect and display of Endocrine glands in laboratory bred rat.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of the permanent slides of all the endocrine glands</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Tissue fixation, embedding in paraffin, microtomy and slide preparation of any endocrine gland</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>H-E staining of Histological slides.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**DSE-2 (Semester 6)**  
**DSE2. Animal Biotechnology**

<b>ZOOA-DSE(A)-6-2-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction</b>	SK	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Molecular Techniques in Gene manipulation</b>	SK	23	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Genetically Modified Organisms</b>	DG	12	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Culture Techniques and Applications</b>	DG	10	Theore Lecture method using books, powerpoint presentation, videos, group discussion and class test tical
<b>Total Marks -50</b>			
<b>Animal Biotechnology Lab, ZOOA-DSE(A)-6-2-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Genomic DNA isolation from E. coli and Plasmid DNA isolation (pUC 18/19) from E. coli</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>To study following techniques through photographs - Southern Blotting, Northern Blotting, Western Blotting, PCR, DNA fingerprinting</b>	SK	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Project report on animal cloning &amp; Application &amp; ethical Issues</b>	DG	30	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**Semester 6**  
**DSE2. Fish and Fisheries**  
**ZOOA-DSE(B)-6-2-TH**

<b>ZOOA-DSE(B)-6-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction and Classification</b>	SB	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Morphology and Physiology</b>	SP	14	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Fisheries</b>	SP	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Aquaculture</b>	SB	16	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Fish in research</b>	SB	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Fish and Fisheries Lab, ZOOA-DSE(B)-6-2-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>1. Morphometric and meristic characters of fishes</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>2. Identification of <i>Petromyzon</i>, <i>Myxine</i>, <i>Pristis</i>, <i>Exocoetus</i>, <i>Hippocampus</i>, <i>Gambusia</i>, <i>Labeo</i>, <i>Heteropneustes</i>, <i>Anabas</i></b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>3. Study of different types of scales (through permanent slides/ photographs).</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>4. Study of crafts and gears used in Fisheries (Photographs)</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>5. Water quality criteria for Aquaculture: Assessment of pH, alkalinity, Salinity.</b>	SB	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>6. Study of air breathing organs in <i>Channa</i>, <i>Heteropneustes</i>, <i>Anabas</i> and <i>Clarias</i></b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>7. Project Report on a visit to any fish farm/ pisciculture unit/Zebrafish rearing Lab.</b>	SP		Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**SEC-1 (Semester 3)**  
**SEC-1 Apiculture**

<b>ZOOA-SEC(A)-3-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Biology of Bees</b>	SK	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Rearing of Bees</b>	GH	14	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Diseases and Enemies</b>	SK	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Bee Economy</b>	SK	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Entrepreneurship in Apiculture</b>	GH	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

**SEC-1 (Semester 4)**

**SEC-1.Aquarium Fish Keeping**

<b>ZOOA-SEC(B)-4-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Aquarium Fish Keeping</b>	GH	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Biology of Aquarium Fishes</b>	SK	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Food and feeding of Aquarium fishes</b>	SK	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Fish Transportation</b>	GH	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Maintenance of Aquarium</b>	SK	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

**TEACHING PLAN (Zoology General)**  
**Academic Session 2022-2023**  
**Under CBCS System**  
**Semester 1(July-December)**  
**CC – 1**  
**CORE COURSE 1. Animal Diversity**

<b>ZOOG-CC1-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Kingdom Protista</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Phylum Porifera</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Phylum Cnidaria</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Phylum Platyhelminthes</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Phylum Nemathelminthes</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Phylum Annelida</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Phylum Arthropoda</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Phylum Mollusca</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Phylum Echinodermata</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 10: Protochordates</b>	SK	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 11: Agnatha</b>	SK	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 12: Pisces</b>	SK	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test

<b>Unit 13: Amphibia</b>	<b>DG</b>	<b>4</b>	<b>Lecture method using books, powerpoint presentation, videos, group discussion and class test</b>
<b>Unit 14: Reptiles</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 15: Aves</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 17: Mammals</b>	SK	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			

### Animal Diversity, ZOOG-CC1-1-P

<b>Animal Diversity, ZOOG-CC1-1-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Identification with reasons of the following specimens:- Amoeba, Euglena, Paramecium, Sycon, Obelia, Aurelia, Metridium, Taenia solium, Ascaris lumbricoides (Male and female), Aphrodite, Nereis, Hirudinaria, Palaemon, Cancer, Limulus, Apis, Chiton, Dentalium, Unio, Sepia, Octopus, Echinus, Cucumaria and Antedon, Balanoglossus, Torpedo, Branchiostoma, Petromyzon, Labeo rohita, Exocoetus, Salamandra, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Bat, Funambulus</b>	DG	20	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Key for Identification of poisonous and non-poisonous snakes</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of anatomy of digestive system, salivary gland, mouth parts of Periplaneta, Study of reproductive system of female cockroach</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**CC – 2(Semester-2)**  
**CORE COURSE 2.Comparative Anatomy & Developmental Biology**

<b>ZOOG-CC2-2-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Integumentary System</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Digestive System</b>	SK	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Respiratory System</b>	SK	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Circulatory System</b>	SK	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Urino-genital System</b>	SP	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Early Embryonic Development</b>	SP	14	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Late Embryonic Development</b>	SP	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Comparative Anatomy &amp; Developmental Biology Lab, ZOOG-CC2-2-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Osteology: Limb bones, girdle and vertebra of Pigeon &amp; Guineapig, Mammalian skulls: One herbivorous; Guinea pig and one carnivorous; Dog.</b>	SP	20	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Larval stages: Veliger, Nauplius, Trochophore, Mysis</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of the different types of placenta-histological sections through photomicrographs</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Developmental stages of chick embryo: 24 Hrs., 48 Hrs, 72 Hrs., 96 Hrs.</b>	DG	10	
<b>Total Marks -30</b>			

**CORE COURSE 3. PHYSIOLOGY AND BIOCHEMISTRY**

<b>ZOOG-CC3-3-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Nerve and muscle</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Digestion</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Respiration</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Cardio-vascular system</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Excretion</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Reproduction and Endocrine Glands</b>	GH	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Carbohydrate Metabolism</b>	GH	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Lipid metabolism</b>	GH		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Protein Metabolism</b>	GH	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 10. Enzyme</b>	GH	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>PHYSIOLOGY AND BIOCHEMISTRY Lab; ZOOG-CC3-3-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of permanent histological sections of mammalian duodenum, liver, lung, kidney.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Qualitative test for carbohydrate samples</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			



**CC – 4(Semester-4)**  
**CORE-COURSE 4.Genetics & Evolutionary Biology**

<b>ZOOG-CC4-4-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1:Mendelian Genetics and its Extension</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Linkage, Crossing Over</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Mutation</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Sex determination</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Origin of Life</b>	GH	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Evolutionary Theories</b>	GH	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 7: Process of Evolutionary changes</b>	GH	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Speciation</b>	GH	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Genetics and Evolutionary Biology Lab ZOOG-CC4-4-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Verification of Mendelian Ratio using Chi square test.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Identification of Human Aneuploidy using photo graph of karyotype.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Phylogeny of horse with diagram of limb and skull.</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study and identification of Darwin Finches from photographs</b>	GH	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Visit to natural history museum and submission of report.</b>	SB	20	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**Discipline specific courses**  
**Semester-5**  
**DSE-A**  
**Applied Zoology.ZOOG-DSE-A-5-1-TH**

<b>Applied Zoology.ZOOG-DSE-A-5-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Host &amp; Parasite Relationship</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Epidemiology of Diseases</b>	SP	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Parasitic Protozoa</b>	SP	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Parasitic Helminthes</b>	SP	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Insect of Economic Importance</b>	SP	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Insect of Medical Importance</b>	DG	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Animal Husbandry</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Poultry Farming</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 10: Fish Technology</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -50</b>			
<b>Applied Zoology. ZOOG-DSE-A-5-1-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Study of Plasmodium vivax, Entamoeba histolytica, Trypanosoma gambiense, Ancylostoma duodenale and Wuchereria bancrofti and their life stages through permanent slides/photomicrographs or specimens</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of arthropod vectors associated with human diseases: Pediculus, Culex, Anopheles, Aedes</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Study of insect damage to different plant parts/stored grains through damaged products/photographs</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos

<b>Identifying feature and economic importance of <i>Helicoverpa</i>; <i>Heliothis armigera</i>, <i>Papilio demoleus</i>, <i>Pyrilla perpusilla</i>, <i>Callosobruchus chinensis</i>, <i>Sitophilus oryzae</i> and <i>Tribolium castaneum</i></b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Visit to poultry farm or animal breeding centre. Submission of visit report</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Maintenance of freshwater aquarium(demonstration only)</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Total Marks -30</b>			

**Semester-6**  
**DSE-B**  
**Ecology& Wild life Biology;ZOOG-DSE-B-6-2-TH**

<b>Ecology&amp; Wild life Biology;ZOOG-DSE-B-6-2-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Ecology</b>	SP	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Population</b>	DG	20	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Community</b>	DG	11	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Ecosystem</b>	SP	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Wild Life</b>	SP	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test

**Total Marks -50**

<b>Ecology&amp; Wild life Biology;ZOOG-DSE-B-6-2-P</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Identification of flora, mammalian fauna, avian fauna</b>	DG	10	Practical demonstration with hands on activity, powerpoint presentation and videos
<b>Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses)</b>	SP	10	Practical demonstration with hands on activity, powerpoint presentation and videos

<b>Familiarization and study of animal evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, etc.</b>	<b>DG</b>	<b>10</b>	<b>Practical demonstration with hands on activity, powerpoint presentation and videos</b>
<b>Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method), Chemical Oxygen Demand and free CO<sub>2</sub></b>	<b>SP</b>	<b>10</b>	<b>Practical demonstration with hands on activity, powerpoint presentation and videos</b>
<b>Total Marks -30</b>			

**Skill Enhancement Elective Courses (SEC)**  
**SEMESTER –3**  
**SEC-A**  
**APICULTURE; ZOOG-SEC-A-3-1-TH**

<b>APICULTURE; ZOOG-SEC-A-3-1-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Biology of Bees</b>	<b>GH</b>	<b>2</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Rearing of Bees</b>	<b>GH</b>	<b>14</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Diseases and Enemies</b>	<b>GH</b>	<b>6</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Bee Economy</b>	<b>SP</b>	<b>2</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Entrepreneurship in Apiculture</b>	<b>SP</b>	<b>6</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

**SEMESTER – 4**  
**SEC-B**  
**AQUARIUM FISH KEEPING; ZOOG-SEC-B-4-2-TH**

<b>AQUARIUM FISH KEEPING; ZOOG-SEC-B-4-2-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction to Aquarium Fish Keeping</b>	<b>GH</b>	<b>2</b>	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Biology of Aquarium Fishes</b>	<b>SB</b>	<b>10</b>	Lecture method using books, powerpoint presentation, videos, group

			discussion and class test
<b>Unit 3: Food and feeding of Aquarium fishes</b>	SB		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Fish Transportation</b>	SP		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Maintenance of Aquarium</b>	SB		Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

## SEMESTER –5

### SEC-A

#### Sericulture; ZOOG-SEC-A-5-3-TH

<b>Sericulture; ZOOG-SEC-A-5-3-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Introduction</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Biology of Silkworm</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Rearing of Silkworms</b>	DG	10	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Pests and Diseases</b>	SP	7	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Entrepreneurship in Sericulture</b>	SP	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

**SEMESTER –6**  
**SEC-B**  
**Medical diagnosis; ZOOG-SEC-B-6-4-TH**

<b>Medical diagnosis; ZOOG-SEC-B-6-4-TH</b>	<b>Teacher</b>	<b>Class Hour</b>	<b>Teaching Method</b>
<b>Unit 1: Diagnostics Methods Used for Analysis of Blood</b>	DG	8	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 2: Diagnostic Methods Used for Urine Analysis</b>	DG	4	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 3: Non-infectious Diseases</b>	DG	6	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 4: Infectious Diseases</b>	RM	3	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 5: Clinical Biochemistry</b>	DG	1	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 6: Clinical Microbiology</b>	SP	1	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 8: Tumours</b>	SP	2	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Unit 9: Visit to Pathological Laboratory and Submission of Project</b>	DG	5	Lecture method using books, powerpoint presentation, videos, group discussion and class test
<b>Total Marks -80</b>			

NAME OF TEACHERS  
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DR SRIPARNA KUTHE (SK)  
MR SANTU PARIA (SP)  
DR GARIMA HORE (GH)  
MS DEBASMITA GHOSAL (DG)