

**THE UNIVERSITY OF BURDWAN**



**COURSE MODULES**

**FOR THREE-YEAR DEGREE  
COURSE IN ZOOLOGY  
(GENERAL) UNDER CHOICE  
BASED CREDIT SYSTEM  
(CBCS)**

**SEMESTER I**

**(With effect from the session July  
2018 - December 2018)**

## 3.9 CORE COURSE I Animal diversity

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)

Lectures: 50

Questions are to be set covering the entire syllabus; 5 questions (out of eight) of 2 marks each, two questions (out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

Animal diversity	4 Credit	Class	TEACHER
<b>Unit-1 Kingdom Protista</b>		<b>3</b>	
General characters and classification of Subkingdom Protozoa up to phylum		1	AR
Locomotory Organelles and locomotion in Protozoa		2	MM
<b>Unit-2 Phylum Porifera</b>		<b>3</b>	
General characters and classification up to classes		1	SB
Canal System in Sycon		2	SB
<b>Unit-3 Phylum Cnidaria</b>		<b>2</b>	
General characters and classification up to classes		1	MM
Polymorphism in hydrozoa		1	MM
<b>Unit-4 Phylum Platyhelminthes</b>		<b>2</b>	
General characters and classification up to classes		1	MM
Life history of <i>Taenia solium</i>		1	MM
<b>Unit-5 Phylum Nematoda</b>		<b>3</b>	
General characters and classification up to classes		1	AR
Life history of <i>Ascaris lumbricoides</i> and its parasitic adaptations		2	MM
<b>Unit-6 Phylum Annelida</b>		<b>3</b>	
General characters and classification up to classes		2	SB
Nephridia in Annelida		1	SB
<b>Unit 7: Arthropoda</b>		<b>5</b>	
General characters and classification up to classes		2	MM
Vision in insects		2	MM
Metamorphosis in Insects		1	MM
<b>Unit 8: Phylum Mollusca</b>		<b>3</b>	
General characteristics and classification up to Classes		1	AR
Respiration in Pila		2	AR
<b>Unit 9: Phylum Echinodermata</b>		<b>4</b>	
General characters and classification up to classes		2	SB
Water-vascular system in <i>Asterias</i>		2	SB
<b>Unit-10 Protochordates</b>		<b>2</b>	
General features in <i>Branchiostoma</i>		1	AR
Feeding in <i>Branchiostoma</i>		1	AR
<b>Unit-11 Agnatha</b>		<b>2</b>	
General features and classification up to classes (Young, 1981)		2	SB
<b>Unit-12 Pisces</b>		<b>3</b>	
General features and Classification up to Subclasses		1	AR
Osmoregulation in Fishes		2	MM
<b>Unit-13 Amphibia</b>		<b>3</b>	
General features and Classification up to living orders		2	SB
Metamorphosis in Toad		1	SB
<b>Unit-14 Reptiles</b>		<b>4</b>	
General features and Classification up to living Subclass		1	AR
Poisonous and non-poisonous snakes		1	MM
Biting mechanism in snakes		2	MM
<b>Unit-15 Aves</b>		<b>3</b>	

General features and Classification up to order	1	AR
Flight adaptation in birds	2	SB
<b>Unit-16 Mammals</b>	<b>3</b>	
Classification up to Subclasses	1	AR
Origin & distribution of Cranial nerves in <i>Cavia</i>	2	MM

Note: Classification of Unit 1-9 to be followed from –Ruppert & Barnes, (1994), Invertebrate Zoology, VI Edition.

**Suggested Readings [Consult Latest Editions]**

1. Arora, M.P. Chordata I. Himalaya Pub House
2. Barnes, R. D. & Ruppert, E. E., (1994). Invertebrate Zoology. 6th Ed. Brooks Cole.
3. Brusca, R. C. & Brusca, G. J. (2002). Invertebrates. 4th Ed. Sinauer Associates.
4. Chatterjee, A & Chakraborty C.S. Approach to a Text Book of Zoology Nirmala Library, Kolkata.
5. Dhami P.S and J.K. Dhami – Invertebrate Zoology – S. Chand and Co.

CORE COURSE I Animal diversity Lab

Animal diversity	2 Credits	Class	Teacher
<b>List of Practical</b>			
<b>1. Spot identification of:</b>			
Amoeba, Euglena, Plasmodium, Paramecium, Sycon, Euspongia,, Obelia, Physalia, Aurelia, Tubipora, Metridium, Taenia solium, Male and female Ascaris lumbricoides, Aphrodite, Nereis, Pheretima, Hirudinaria, Palaemon, Cancer, Limulus, Palamnaeus, Scolopendra, Julus, Periplaneta, Apis, Chiton, Dentalium, Pila, Unio, Loligo, Sepia, Octopus, Pentaceros, Ophiura, Echinus, Cucumaria and Antedon	1	AR	
Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis, Passer, Psittacula, Alcedo, Sorex, Pteropus, Funambulus, Suncus	1	MM	
2. Study of the following permanent slides: Transverse section of male and female <i>Ascaris</i>	1	SB	
3. Identification of poisonous and non-poisonous snakes	1	SB	
4. An “animal album” containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.		AR	
<b>Time:2Hrs</b>	<b>Full Marks: 20</b>		
<b>Examination Pattern:</b> Spot identification ( 6 from Item 1: 3 each from non-chordate & chordate ) (6 × 2) = 12 Spot identification (1 each from item 2 & 3 ) (2 × 2) =04 Laboratory Note Book ----- = 02 Animal Album ----- =02			
<b>Suggested Readings:</b>			
1. Chatterjee and Chatterjee Practical Zoology 2. Ghosh, K.C. and Manna, B. (2015): Practical Zoology, New Central Book Agency, Kolkata 3. Sinha, J.K. , Chatterjee, A.K. and P. Chattopadhyay Advanced Practical Zoology			

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**SEMESTER II**

**(With effect from the session  
January 2019 - June 2019)**

### 3.9 CORE COURSE II (COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES)

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)  
Lectures: 50

Questions are to be set covering the entire syllabus; 5 questions (out of eight) of 2 marks each, two questions (out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES	4 Credits	Class	TEACHER
<b>Unit-1 Integumentary System</b>		<b>3</b>	
Derivatives of integument with reference to glands and digital tips		3	MM
<b>Unit-2 Skeletal System</b>		<b>2</b>	
Evolution of visceral arches		2	SB
<b>Unit-3 Digestive System</b>		<b>4</b>	
Brief account of alimentary canal		2	MM
Brief account of digestive glands		2	AR
<b>Unit-4 Respiratory System</b>		<b>3</b>	
Brief account of gills		1	SB
Brief account of lungs, air sacs		1	MM
Brief account of swim bladder		1	AR
<b>Unit-5 Circulatory System</b>		<b>4</b>	
Evolution of heart		2	MM
Evolution aortic arches		2	SB
<b>Unit-6 Urinogenital System</b>		<b>3</b>	
Evolution of kidney		1	AR
Evolution urinogenital ducts		2	AR
<b>Unit 7 Nervous System</b>		<b>2</b>	
Comparative account of brain		2	MM
<b>Unit-8 Sense Organs</b>		<b>3</b>	
Classification of receptors		1	AR
Brief account of auditory receptors in vertebrate		2	SB
<b>Unit-9 Early Embryonic Development</b>		<b>12</b>	
Gametogenesis: Spermatogenesis and oogenesis with reference to mammals, vitellogenesis in birds		4	MM
Fertilization: external (amphibians), internal (mammals), blocks to polyspermy; Early development of frog and chick (structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula)		4	AR
Types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo		4	SB
<b>Unit-10 Late Embryonic Development</b>		<b>6</b>	
Implantation of embryo in humans, Formation of human placenta and functions		2	AR
Other types of placenta on the basis of histology		2	AR
Metamorphic events in frog life cycle and its hormonal regulation.		2	AR
<b>Unit-11 Control of Development</b>		<b>8</b>	
Fundamental processes in development (brief idea) – Gene activation		2	MM
determination, induction, differentiation		2	MM
morphogenesis, intercellular communication		2	SB
cell movements and cell death		2	AR

#### Suggested Readings:

1. Carlson, Bruce M (1996). Patten's Foundations of Embryology, McGraw Hill, Inc.
2. Gilbert, S. F. (2006). Developmental Biology, VIII Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.
3. Hilderbrand, M and Gaslow G.E. Analysis of Vertebrate Structure, John Wiley and Sons.
4. Jordon & Verma . Chordate Emcryp;gy. S. Chand Pub. New Delhi.

5. Kardong, K.V. (2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education.
6. Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition. The McGraw-Hill Companies.
7. Saxena, R.A. & Saxena, S. Coperative Anatomy of Vertebrates. Viva Publication.
8. Walter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House.

**CORE COURSE II (COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES Lab)**

<b>COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES</b>	<b>2 Credits</b>		Class	Teacher
<b>List of Practical</b>				
<b>1. Osteology:</b>				
a) Identification of limb bones and girdles of <i>Columba</i> and <i>Cavia</i>			1	AR
b) Mammalian skulls: <i>Cavia</i> and <i>Canis</i> .			1	AR
32. Frog - Study of developmental stages - whole mounts and sections through permanent slides or photomicrographs – cleavage stages, blastula, gastrula, neurula, tail bud stage, tadpole external and internal gill stages.			1	MM
3. Study of the different types of placenta- histological sections through permanent slides or photomicrographs			1	SB
4. Examination of gametes - frog/rat - sperm and ova through permanent slides or photomicrographs.			1	MM
<b>Time:2Hrs</b>		<b>Full Marks: 20</b>		
<b>Examination Pattern:</b>				
Spot identification ( 5 from item 1 ) (5 × 2) = 10				
Spot identification (4 from item 2, 3 & 4 ) (4 × 2) = 08				
Laboratory Note Book ----- =02				
<b>Suggested Readings:</b>				
1. Chatterjee and Chatterjee: Practical Zoology				
2. Ghosh, K.C. and Manna, B. (2015): Practical Zoology, New Central Book Agency, Kolkata				

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**SEMESTER III**

**(With effect from the session  
JULY 2019 - DECEMBER 2019)**



### 3.9 CORE COURSE III (PHYSIOLOGY AND BIOCHEMISTRY)

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)

Lectures: 50

Questions are to be set covering the entire syllabus; 5 questions (out of eight) of 2 marks each, two questions (out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

PHYSIOLOGY AND BIOCHEMISTRY	4 Credits	Class	TEACHER
<b>Unit-1 Nerve and muscle</b>		<b>8</b>	
1. Structure of a neuron, Resting membrane potential, Graded potential		2	MM
Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres.		3	MM
Ultra-structure of skeletal muscle		1	MM
Molecular and chemical basis of muscle		2	MM
<b>Unit-2 Digestion</b>		<b>5</b>	
Physiology of digestion in the alimentary canal		2	SB
Absorption of carbohydrates		1	SB
Absorption of proteins, lipids		2	SB
<b>Unit-3 Respiration</b>		<b>5</b>	
Pulmonary ventilation, Respiratory volumes and capacities		3	MM
Transport of oxygen and carbon dioxide in blood		2	MM
<b>Unit-4 Excretion</b>		<b>5</b>	
Structure of nephron		1	AR
Mechanism of Urine formation		2	AR
Counter-current mechanism		2	MM
<b>Unit-5 Cardiovascular system</b>		<b>6</b>	
Composition of blood		1	AR
Homeostasis, Structure of Heart		1	AR
Origin and conduction of the cardiac impulse		2	MM
Cardiac cycle		2	MM
<b>Unit-6 Reproduction and Endocrine Glands</b>		<b>7</b>	
Physiology of male reproduction		1	SB
hormonal control of spermatogenesis		1	SB
Physiology of female reproduction		1	MM
Hormonal control of menstrual cycle		2	MM
Structure and function of pituitary, thyroid, pancreas and adrenal		2	SB
<b>Unit 7 Carbohydrate: Structure and Metabolism</b>		<b>8</b>	
Introduction to Carbohydrates		1	AR
Structure & Types of Carbohydrates		1	AR
Isomerism, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle		2	AR
Pentose phosphate pathway		2	MM
Gluconeogenesis, Electron transport chain		2	MM
<b>Unit-8 Lipid: Structure and Metabolism</b>		<b>5</b>	
Introduction to Lipids		1	AR
Definitions of fats and oils; classes of lipids		2	AR
Lipoproteins; Biosynthesis and $\beta$ oxidation of palmitic acid		2	MM
<b>Unit-9 Protein: Structure and metabolism</b>		<b>5</b>	
Proteins and their biological functions of amino acids		1	AR
physicochemical properties of amino acids		1	AR
structure and properties ;primary structure of protein		1	AR
secondary, tertiary and quaternary structures		1	SB

Transamination; Deamination and Urea Cycle	1	MM
<b>Unit-10 Enzymes</b>	<b>4</b>	
Introduction, Classification of Enzymes	1	SB
Mechanism of action, Enzyme kinetics	1	SB
Enzyme inhibition and Regulation	2	MM

### Reference Books

1. Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edn. W.H Freeman & Co.
2. Chatterjee, MN and Shinde, R (2012) . A Textbook of Medical Biochemistry.
3. Das, D. (200). Biochemistry. Central Book Agency, Kolkata
4. Deb, A.C.
5. Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
6. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). Harper's Illustrated Biochemistry. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.
7. Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). Principles of Biochemistry. IV Edition. W.H. Freeman and Co
8. Sathyanarayana U. and Chakrapani, (2002). Biochemistry –Books & Allied (P) Ltd, Kolkata
9. Sembulingam and Sembulingam (2012) Essentials of Medical Physiology. 6th Edn.
10. Sherwood, L. (2013). Human Physiology from cells to systems. 8th Edn., Brooks & Cole

### CORE COURSE III (PHYSIOLOGY AND BIOCHEMISTRY Lab)

PHYSIOLOGY AND BIOCHEMISTRY Lab	2 Credits		Class	Teacher
<b>List of Practical</b>				
Preparation of hemin crystals			1	SB
Identification of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland, small intestine, liver, lung, kidney			1	AR
Qualitative tests to identify functional groups of carbohydrates in given solutions: Glucose (Benedict's test), Sucrose (Iodine test)			3	SB
Quantitative estimation of total protein in given solutions by Lowry's method.			1	MM
Study of activity of salivary amylase under optimum condition			1	AR
<b>Time:2Hrs</b>		<b>Full Marks: 20</b>		
<b>Examination Pattern:</b>				
One question on Qualitative test (Item No. 1)	1X04=04			
One question on qualitative test (From Item 3)	1X04=04			
One question from quantitative test item no. 4	1X06=06			
Identification of histological section (From Item No. 2)	2X04=04			
Laboratory Note Book	=02			

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**SEMESTER IV**

**(With effect from the session January  
2021 - June 2021)**

## CORE COURSE IV (GENETICS AND EVOLUTIONARY BIOLOGY)

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)

Lectures: 50

Questions are to be set covering the entire syllabus; 5 questions (out of eight) of 2 marks each, two questions (out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

GENETICS AND EVOLUTIONARY BIOLOGY	4 Credits	Class	TEACHER
<b>Unit-1 Introduction to Genetics</b>		<b>3</b>	
Mendel's work on transmission of traits		1	MM
Genetic Variation, Molecular basis of Genetic Information		2	MM
<b>Unit-2 Mendelian Genetics and its Extension</b>		<b>5</b>	
Principles of Inheritance, Chromosome theory of inheritance		1	AR
Incomplete dominance and co-dominance		1	AR
Multiple alleles, Lethal alleles		1	MM
Epistasis, Pleiotropy, Sex-linked inheritance, Extrachromosomal inheritance		2	MM
<b>Unit-3 Linkage, Crossing Over and Chromosomal Mapping</b>		<b>5</b>	
Linkage and crossing over, Recombination frequency as a measure of linkage intensity		1	MM
Two factor and three factor crosses, Interference and coincidence		2	MM
Somatic cell genetics - an alternative approach to gene mapping		2	SB
<b>Unit-4 Mutations</b>		<b>7</b>	
Chromosomal Mutations: Deletion, Duplication, Inversion		2	SB
Translocation, Aneuploidy and Polyploidy		3	SB
Gene mutations: Induced versus Spontaneous mutations		3	SB
<b>Unit-5 Sex Determination</b>		<b>4</b>	
Chromosomal mechanisms of sex determination		2	MM
dosage compensation (human)		2	MM
<b>Unit-6 History of Life</b>		<b>2</b>	
Origin of Life		2	AR
<b>Unit 7 Introduction to Evolutionary Theories</b>		<b>3</b>	
Lamarckism		1	AR
Darwinism, Neo-Darwinism		2	AR
<b>Unit-8 Direct Evidences of Evolution</b>		<b>3</b>	
Types of fossils, Incompleteness of fossil record		1	AR
Dating of fossils, Phylogeny of horse		2	AR
<b>Unit-9 Processes of Evolutionary Change</b>		<b>5</b>	
Organic variations; Isolating Mechanisms		2	MM
Natural selection (Example Industrial melanism); Types of natural selection		2	MM
Artificial selection		1	MM
<b>Unit-10 Species Concept</b>		<b>4</b>	
Biological species concept (Advantages and Limitations)		2	SB
Modes of speciation (Allopatric, Sympatric)		2	SB
<b>Unit-11 Macro-evolution</b>		<b>5</b>	
Macro-evolutionary principles (example: Darwin's Finches)		5	AR
<b>Unit-12 Extinction</b>		<b>4</b>	
Mass extinction (Causes, Names of five major extinctions)		2	AR
K-T extinction in detail, Role of extinction in evolution		2	SB

### Suggestive Readings

1. Barton, N. H., Briggs, D. E. G., Eisen, J. A., Goldstein, D. B. and Patel, N. H. (2007). Evolution. Cold Spring, Harbour Laboratory Press.
2. Brooker, R.J. (2012). Genetics: Analysis and Principles. 4th Edn. McGraw Hill.

3. Chattopadhyay, S. (2012). Life: Evolution, Adaptation, Ethology. 3rd Edn. Books and Allied, Kolkata.
4. Futuyma, D. J. (1997). Evolutionary Biology. Sinauer Associates.
5. Gardner, E.J., Simmons, s, M.J., Snustad, D.P. (2008). Principles of Genetics. VIII Ed. Wiley India.

**CORE COURSE IV (GENETICS AND EVOLUTIONARY BIOLOGY Lab)**

<b>GENETICS AND EVOLUTIONARY BIOLOGY</b>	<b>2 Credits</b>	<b>Class</b>	<b>TEACHER</b>
<b>List of Practical</b>			
1. Study of Mendelian Inheritance and gene interactions using suitable examples. Verify the results using Chi-square test	1	MM	
2. Study of Linkage, recombination, gene mapping using the data	1	AR	
3. Study of Human Karyotypes; normal and abnormal (Turner's, Down's and Klinefelter syndrome) from photographs	1	MM	
4. Study of fossil evidences from plaster cast models /picture	1	AR	
5. Study of homology and analogy from suitable specimens/ pictures	1	SB	
6. Charts: a) Phylogeny of horse with diagrams/ cut outs of limbs and teeth of horse ancestors b) Darwin's Finches with diagrams/ cut outs of beaks of different species	1	SB	
7. Visit to any Zoological Museum and submission of report			
<b>Full Marks: 20</b>			
<b>Examination Pattern:</b>			
One question from Item No. 1 ----- (5 × 1) = 05			
One question from Item No. 2 ----- (5× 1) = 05			
Identification any three from Item No. 3, 4, 5 & 6 (2 × 3) = 06			
Excursion Report _____ = 02			
Laboratory Note Book ----- = 02			

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**SEMESTER V**

**(With effect from the session JULY  
2021 - DECEMBER 2021)**

## DSE 2: APPLIED ZOOLOGY

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)Lectures: 50

Questions are to be set covering the entire syllabus; 5 questions (out of eight) of 2 marks each, two questions (out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

	4 Credits	Class	TEACHER
<b>Unit-1 Introduction to Host-parasite Relationship</b>		3	
Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis			AR
<b>Unit-2 Epidemiology of Diseases</b>		7	
Transmission, Prevention and control of diseases: Tuberculosis		4	AR
Transmission, Prevention and control of diseases: Typhoid		3	MM
<b>Unit-3 Rickettsia and Spirochetes</b>		3	
Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum			SB
<b>Unit-4 Parasitic Protozoa</b>		6	
Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense			MM
<b>Unit-5 Parasitic Helminthes</b>		4	
Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti			SB
<b>Unit-6 Insects of Economic Importance</b>		8	
Biology, Control and damage caused by Helicoverpa armigera, Pyrrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum			SB
<b>Unit-7 Insects of Medical Importance</b>		8	
Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis			AR
<b>Unit-8 Animal Husbandary</b>		3	
Preservation of semen and artificial insemination in cattle			SB
<b>Unit-9 Poultry Farming</b>		4	
Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs			SB
<b>Unit-10 Fish Technology</b>		4	
Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed			SB

### Suggested Readings:

1. Arora, D. R and Arora, B. (2001). Medical Parasitology. II Edition. CBS Publications and Distributors
2. Atwal, A.S. (1986). Agricultural Pests of India and South East Asia, Kalyani Publishers
3. Banerjee, G.C. (). Animal husbandry
4. Chatterjee, K. D. (2009). Parasitology: Protozoology and Helminthology. XIII Edition, CBS Publishers & Distributors(P) Ltd
5. Dunham R.A. (2004). Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K

DSE 1: APPLIED ZOOLOGY Lab

Applied Zoology	2 Credits	Class	TEACHER
<b>List of Practical</b>			
Study and Identification of Plasmodium vivax, Entamoeba histolytica, Ancylostoma duodenale and Wuchereria bancrofti and their life stages through permanent slides/photomicrographs or specimens.		4	
Study and Identification of arthropod vectors associated with human diseases: Pediculus, Culex, Anopheles, Aedes and Xenopsylla		2	MM
Study and Identification of insect damage to different plant parts/stored grains through damaged products/photographs		2	AR
Identifying features and economic importance of Nilaparvata lugens, Apion corchori, Scirpophaga incertulus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum		2	MM
Visit to poultry farm/ animal breeding centre/ vector biology/ parasitology Centre. Submission of visit report			
Maintenance of freshwater aquarium			
<b>Full Marks: 20</b>			
<b>Examination Pattern:</b>			
One Experiment from Item No. 3 or 4	-----	(6X 1) =	06
One Experiment from Item No. 2	-----	(7X 1) =	07
One experiment from Item No. 1 or 5		(1 X5) =	05
Laboratory Note Book -----			= 02



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**SEMESTER VI**

**(With effect from the session January  
2022 - June 2022)**

## DSE 2: INSECT, VECTORS AND DISEASES

Time: 2hrs

Full Marks: 50 (40 theory+10 internal assessment)Lectures: 50

Questions are to be set covering the entire syllabus;5questions (out of eight) of 2 marks each, tow questions(out of four) of 5 marks each and two questions (out of four) of 10 marks each are to be answered

<b>INSECT, VECTOR AND DISEASES</b>	<b>4 Credits</b>	<b>Class</b>	<b>TEACHER</b>
<b>Unit-1 Introduction to Insects</b>		<b>6</b>	
General Features of Insects		1	AR
Morphological features		1	AR
Head – Eyes, Types of antennae,		2	AR
Mouth parts with respect to feeding habit		2	AR
<b>Unit-2 Concept of Vectors</b>		<b>6</b>	
Brief introduction to Vectors (mechanical and biological)		2	MM
Reservoirs, Host-vector relationships		2	MM
Adaptations as vectors, Host specificity		2	MM
<b>Unit-3 Insects as Vector</b>		<b>8</b>	
Detailed features of insect orders as vectors – Diptera		2	AR
Detailed features of insect orders as vectors – Siphonoptera		2	AR
Detailed features of insect orders as vectors – Siphunculata		2	AR
Detailed features of insect orders as vectors – Hemiptera		2	AR
<b>Unit-4 Dipteran as Disease Vectors</b>		<b>14</b>	
Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies		5	MM
Study of mosquito-borne diseases – Malaria, Dengue		3	MM
Study of mosquito-borne diseases – Chikungunya, Viral encephalitis		3	MM
Study of mosquito-borne diseases Filariasis ;Control of mosquitoes		3	MM
<b>Unit-5 Siphonaptera as Disease Vectors</b>		<b>6</b>	
Fleas as important insect vectors; Host-specificity		2	AR
Study of Flea-borne diseases – Plague, Typhus fever		3	AR
Control of fleas		1	AR
<b>Unit-6 Siphunculata as Disease Vectors</b>		<b>4</b>	
Human louse (Head, Body and Pubic louse) as important insect vectors		2	SB
Control of human louse		2	SB
<b>Unit-7 Hemiptera as Disease Vectors</b>		<b>6</b>	
Bugs as insect vectors; Blood-sucking bugs		2	SB
Chagas disease, Bed bugs as mechanical vectors		2	AR
Control and prevention measures		2	AR

### Suggested Readings:

1. Chandra, G. (2000). Mosquito. Sribhumi Publication Co.Kolkata
2. Chapman, R.F. (1998).The Insects: Structure and Function. IV Edition, Cambridge University Press, UK
3. Hati A.K. (1998 ). Medical Entomology, Allied Book Agency, Kolkata
4. Imms, A.D. (1977). A General Text Book of Entomology. Chapman & Hall, UK
5. Mathews, G. (2011). Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases. Wiley-Blackwell
6. Pedigo, L.P. (2002).Entomology and Pest Management. Prentice Hall Publication

### DSE: INSECT, VECTORS AND DISEASES Lab

INSECT VECTORS AND DISEASES	2 Credits	Class	TEACHER
<b>List of Practical</b>			
1. Mounting and Study of different kinds of mouth parts of insects		1	AR
2. Spot identification of following insect vectors through permanent slides/photographs: <i>Aedes</i> , <i>Culex</i> , <i>Anopheles</i> , <i>Pediculus humanuscapitis</i> , <i>Pediculus humanuscorporis</i> , <i>Phithiruspubis</i> , <i>Xenopsylla cheopis</i> , <i>Cimex lectularius</i> , <i>Phlebotomus argentipes</i> , <i>Musca domestica</i>		2	MM
3. Study of different diseases transmitted by above insect vectors		1	SB
4. Submission of a project report on any one of the insect vectors and disease transmitted		1	AR
<b>Full Marks: 20</b>			
<b>Examination Pattern:</b>			
One question from Item No. 1 ----- (8 × 1)			= 08
Identification of four specimens Item No. 2 ----- (1.5 × 4)			= 06
Project Report			= 04
Laboratory Note Book -----			= 02