Tripura University

(A Central University)

Suryamaninagar

West Tripura, Tripura – 799022

Syllabus for

Four Year Under Graduate Programme

Subject: Zoology

(Major)

Revised Syllabus

12/12/2023

(NEP – 2020)

Year – 2023

Tripura University
(A Central University)

Course Structure of Zoology (UG Programme)
As per NEP-2020 under Tripura University

ZOOLOGY MAJOR

Year	Semester	Paper Code	Paper No.	Credits	Marks	Paper Name
1st Year	I	ZL101C	Paper 1 Theory	4	100 IA=40 + ESE= 60	Non-Chordates
		ZL102C	Paper 2A Theory	2	60 IA=24 + ESE=36	Economic Zoology
			Paper 2B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 1 & 2A
	II	ZL103C	Paper 3 Theory	4	100 IA=40 + ESE= 60	Chordates
		ZL104C	Paper 4A Theory	2	60 IA=24 + ESE=36	Cell Biology
			Paper 4B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 3 & 4A
2nd Year	III	ZL201C	Paper 5 Theory	4	100 IA=40 + ESE= 60	Genetics
		ZL202C	Paper 6A Theory	2	60 IA=24 + ESE=36	Developmental Biology
			Paper 6B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 5 & 6A
	IV	ZL203C	Paper 7 Theory	4	100 IA=40 + ESE= 60	Animal Physiology
		ZL204C	Paper 8A Theory	2	60 IA=24 + ESE=36	Endocrinology and Reproductive Biology
			Paper 8B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 7 & 8A
3rd Year	V	ZL301C	Paper 9 Theory	4	100 IA=40 + ESE= 60	Evolutionary Biology and Chronobiology
		ZL302C	Paper 10A Theory	2	60 IA=24 + ESE=36	Adaptation and Zoogeography

			Paper 10B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 9 & 10A
		ZL303C	Paper 11 Theory	4	100 IA=40 + ESE= 60	Ecology
		ZL304C	Paper 12A Theory	2	60 IA=24 + ESE=36	Parasitology and Basic Microbiology
			Paper 12B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 11 & 12A
	VI	ZL305C	Paper 13 Theory	4	100 IA=40 + ESE= 60	Basics of Systematic and Biostatistics
		ZL306C	Paper 14A Theory	2	60 IA=24 + ESE=36	Biochemistry
			Paper 14B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 13 & 14A
		ZL307C	Paper 15 Theory	4	100 IA=40 + ESE= 60	Molecular Biology
		ZL308C	Paper 16A Theory	2	60 IA=24 + ESE=36	Applied Entomology and Pest Management
			Paper 16B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 15 & 16A
4th Year	VII	ZL401C	Paper 17 Theory	4	100 IA=40 + ESE= 60	Tools and Methods in Biology
		ZL402C	Paper 18A Theory	2	60 IA=24 + ESE=36	Biophysics
			Paper 18B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 17 & 18A
		ZL403C	Paper 19 Theory	4	100 IA=40 + ESE= 60	Computational Biology and Biotechnology
		ZL404C	Paper 20A Theory	2	60 IA=24 + ESE=36	Aquaculture
			Paper 20B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 19 & 20A
	VIII	ZL405C	Paper 21 Theory	4	100 IA=40 + ESE= 60	Microbiology and Immunology
		ZL406C	Paper 22A Theory	2	60 IA=24 + ESE=36	Medical Zoology

			Paper 22B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 21 & 22A
		ZL407C	Paper 23 Theory	4	100 IA=40 + ESE= 60	Global Environmental Issues and Biodiversity and Conservation
		ZL408C	Paper 24A Theory	2	60 IA=24 + ESE=36	Research Methodology and Animal Ethics and Intellectual property right (IPR)
			Paper 24B Practical	2	40 IA=16 + ESE=24	Based on Theory Paper 23 & 24A

1st Year

Semester-I

Paper 1: NON-CHORDATES

Paper Code: ZL101C

Total Marks: 100 (IA = 40 + ESE = 60) Credit = 04

Unit - I **(Credits – 04)**

Contribution of National Scientists in Zoology

Salim Ali, Vishwa Gopal Jhingran, Hiralal Chaudhuri, Gopal Ch Bhattacharya, Ramdeo Mishra, Hargobind Khorana, Lalji Singh, Radha D Kale, M K Chandra Sekheran, C. R. Narayan Rao, M. C. Dash, Valmik Thapar.

Phylum - Protozoa

- General Characteristics and classification of sub-kingdom Protozoa upto Phylum.
- Locomotion in *Amoeba*
- Reproduction in *Paramecium*

Phylum - Parazoa

- General characteristics and classification of Porifera upto classes
- Histology & body wall of *Sycon*
- Canal system of *Sycon*

Unit – II

Phylum - Metazoa

- General characteristics and classification of Cnidaria upto classes
- Trimorphism & metagenesis of *Obelia*

Phylum - Platyhelminthes

- General characteristics and classification upto classes
- Life cycle of *Fasciola hepatica*

Phylum - Nemathelminthes

- General characteristics and classification upto classes
- Life cycle of *Ascaris*

Unit – III

Phylum - Annelida

- General characteristics and classification upto classes
- Digestive & excretory system of Earthworm

Phylum - Arthropoda

- General characteristics and classification upto classes
- Digestive system of *Periplaneta*
- Circulation in *Periplaneta*

Unit – IV

Phylum - Mollusca

- General characteristics and classification upto classes
- Respiratory system in *Pila*
- Nervous system in *Pila*

Phylum - Echinodermata
- General characteristics and classification upto classes
- Water vascular system in *Asterias*
- Basic larval form and evolutionary significance

Phylum - Hemichordata
- General characteristics of Hemichordata

Paper 2A: Economic Zoology
Paper Code: ZL102C
Total Marks: 60 (IA = 24 + ESE = 36) Credit = 02

Unit – I
Vermiculture & Vermicomposting
•. Principle of vermicomposting, different ecological categories of earthworm (Epigeic, Endogeic, Anesic), importance of vermicomposting, vermitechnology & management.

Unit – II
Sericulture
- Principle, different types of silk moth and their host plants, rearing methods, diseases of silk moth. Management with special reference to local varieties

Apiculture
- Principle, different types of honey bees, rearing methods, diseases of honey bees. Management with special reference to local varieties

Unit – III
Fresh water pisciculture
- Polyculture
- Induced breeding technology
- Fish seed transportation, fish diseases,
- Management

Unit - IV
Poultry
- Types of breeds
- Methods of rearing
- Diseases and their management

Dairy Farming
- Basics of Dairy farming and management.

Paper 2B: Practical (I)
Paper Code: ZL102C
Total Marks: 40 (IA = 16 + ESE = 24) Credit = 02

1. Identification with reasons
   Paramoecium, Scypha, Obelia, Physalia, Fasciola, Taenia, Ascaris, Metaphire, Hirudinaria, Periplaneta, Limulus, Mite, Pila, Lamellidens, Octopus, Asterias, Balanoglossus.
2. Dissection and display of digestive, reproductive and nervous systems of *Periplaneta.*
3. Mouth parts of *Periplaneta.*
4. Spot identification and economic importance of— *Perionyx, Apis* sp, *Bombyx,* and Carps.
5. Identification of diseases with reasons from the photographs provided of the faunal group.
   - silk moth, fish, poultry.

Semester-II

Paper 3: CHORDATES

Paper Code: ZL103C

Total Marks: 100 (IA = 40 + ESE = 60) Credit = 04

Unit – I

Protochordata

- General characteristics of Cephalochordata with special reference to the ciliary mode of feeding in *Branchiostoma/Amphioxus*.
- General characteristics of Urochordata with special reference to retrogressive metamorphosis in *Ascidia*

Unit – II

Cyclostomata

- General characteristics of Cyclostomata
- Differences between *Petromyzon* and *Myxine*

Pisces

- General Characteristics of Chondrichthyes & Osteichthyes
- Accessory respiratory organs in fishes

Unit – III

Amphibia

- General characteristics and classification upto order
- Parental care in Amphibia
- Neoteny & Paedogenesis in Amphibia

Reptilia

- General characteristics and classification upto order
- Heart of Crocodile
- Differences between venomous and non-venomous snakes
- Biting mechanism of snake

Unit – IV

Aves

- General characteristics and classification upto order
- Double mode of respiration

Mammals

- General characteristics and classification upto order
- Comparative account of heart and aortic arch of mammal with those of bird, reptile, amphibian and fish
- Digestive system of ruminant and non-ruminant

Paper 4A: CELL BIOLOGY
Paper Code: ZL104C
Total Marks: 60 (IA = 24 + ESE = 36) Credit = 02

Unit – I
Cell
- The basic concept of Cell (Prokaryotic and Eukaryotic)
- Cell- Cell theory, cell size, the shape of cells, and types of cells
- Structure and function of prokaryotic cell
- Structure and function of eukaryotic cell – special reference to animal and plant cell
- Differences between animal and plant cells

Unit - II
Structure and function of-
- Plasma membrane
- Nucleus
- Mitochondria
- Golgi bodies
- Ribosomes
- Endoplasmic reticulum
- Lysosomes
- Chromosome
- Nucleic acid

Unit – III
- Cell cycle and regulations
- Cell divisions – Mitosis and Meiosis

Unit - IV
Cancer Biology
- Tumor and its type, characteristics of cancer cells,
- Viral and cellular oncogenes, Development of cancer
- Types of cancer, Types of carcinogens,
- Therapeutics of cancer

Paper 4B: Practical (II)
Paper Code: ZL104C
Total Marks: 40 (IA = 16 + ESE = 24) Credit = 02

1. Identification with reasons —*Branchiostoma, Ascidia,Petromyzon, Myxine, Scoliodon, Hippocampus, Channa, Rohu,Dipnoi, Hyla, Calotes, Naja, Columba, Chiroptera, Bandicota/Rattus.*
2. Dissection and display of digestive system, IXth & Xth cranial nerves of *Cirrhinusmrigala/Channa*
3. Study of gill arch, cycloid & ctenoid scales, hyoid & pectin of fowl.
4. Study of Mitotic cell division stages
5. Study of meiotic cell division stages (permanent slide).
6. Study of salivary gland chromosome from larva of *Drosophila*