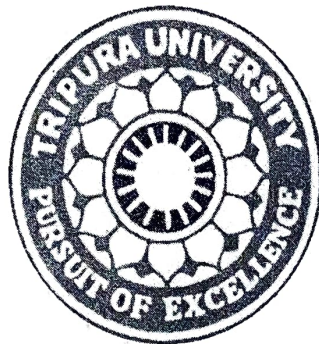


SYLLABUS

Zoology

(General

Year 2014



TRIPURA UNIVERSITY

(A Central University)

Suryamaninagar

799 022

TDPH Zoology (General)

Course Structure as per the syllabus of Tripura University (a Central University)

Year	Semester	Paper	Content	Marks
1 st Year	Semester I	Paper - 1	U-L Non Chordates I (Without Coelom) U-II Non Chordates II (With Coelom) U-III Chordates I (Protochordates to fish) U-IV. Chordates II (Amphibia to mammals)	100
	Semester II	Paper- 2A	U-I. Cell Biology, Histology and Developmental Biology U-II. Biochemistry, Animal Physiology and Endocrinology	50
		Paper - 2B	Practical based on theory of Paper II-A	50
2 nd Year	Semester III	Paper- 3A	U-I. Taxonomy & Classification, Evolution & Adaptation U-II Ecology, Ethology, Zoogeography and Biodiversity	50
		Paper- 3B	Practical based on theory of Paper -III A	50
	Semester-IV	Paper - 4A	U-L Applied Zoology U-II Genetics and Molecular Biology	50
		Paper - 4B	Practical Based on Theory of Paper-IV-A	50
	3 rd Year	Semester- V	Paper- 5A	U-L Parasitology and Medical Entomology U-II Microbiology and immunology
Paper- 5B			Practical Based on Theory of Paper-V-A	50
Semester-VI		Paper- 6	Project in Zoology	100
			i. Project Preparation (literature review, field work/lab work) - 50 ii. Presentation - 25 iii. Viva-25	

Prescribed syllabus of Tripura University for Zoology (THEORY; GENERAL)

Semester I

Paper-1

UNIT I: Non-Chordates (without coelom)

- *Paramecium* sp.: Structure, locomotory organelle and reproduction.
- Sycon; Histology of body wall with special reference to canal system and spicules.
- *Obelia*: Organisation and Life history with special reference to metagenesis.
- Morphology and functional anatomy of *Planaria* & *Fasciola*

UNIT II: Non-Chordates - II (with coelom)

- Mechanism of feeding and structure of digestive system in Earthworm and *Pila*.
- Respiration: Structure and function of: Gills (Prawn). Trachea (Cockroach), Ctenidium and Pulmonary sac (*Pila*).
- Circulation: Open type (Cockroach) and closed type (Earthworm).
- Excretion : Nephridia and its role in Earthworm
- Nervous System: Basic plan of Invertebrates nervous system; Nervous system in. Cockroach and *Pila*.

UNIT III: Chordata -1 (Protochordates to Pisces)

- Branchiostomata: General Organisation, structure of Pharynx & Nephridia, mechanism of feeding and excretion.
- Ascidia: Structure of Pharynx and mechanism to feeding; The life history with special reference to retrogressive metamorphosis. Evolutionary significance of Ascidian Tadpole.
- Cyclostomata: Petromyzon: Difference between *Petromyzon* and *Myxine*; Respiratory system of *Petromyzon*; *Ammocoetes* larva and its significance.
- Lates: Digestive, Respiratory, Circulatory and Urinogenital system.
- Accessory Respiratory organs in fishes.

UNIT IV: Chordata -II (Amphibia to Mammals)

- Digestive system: Functional anatomy of stomach in *Collumba* and Cow.
- Respiratory System: Lungs and mode of respiration in Amphibia, Birds and Mammals.
- Circulatory system: Comparative anatomy of Heart and aortic arches in Amphibia, Reptiles, Birds and Mammals.
- Nervous system: Structure of Brain in Toad and Guinea pig; Cranial Nerves-Origin, distribution and function; Difference between Sympathetic and Para- Sympathetic Nervous system.
- Difference between poisonous and non-poisonous snakes
- Exoskeletal structure in birds and mammals

Prescribed syllabus of Tripura University for

SEMESTER II Zoology (General) Theory

Paper 2A

- **Unit —I: Cell Biology, Histology and Developmental Biology**
 - Ultra-structure and function of different cell organelles-Plasma membrane, Golgi complex, Mitochondria & Endoplasmic Reticulum.
 - Ultra-structure of Chromosome with special reference to Nucleosome model.
 - Cell cycle, Mitotic & Meiotic Cell Divisions.
 - Outline classification, distribution, and functions of Animal tissues.
 - Histology and Functions of Skin, Liver, Pancreas, Thyroid, Testis and Ovary in mammals.
 - Gametogenesis, Ultra structure of sperm and ovum in mammals.
 - Physico-chemical events in fertilization. Egg Types, Cleavage and Blastulation in Amphibians. Role of Yolk in Cleavage.
 - Fate Map and Gastrulation in frog
 - Extra-embryonic Membrane: Formation and Function in Chick Embryo.
 - Placenta : Types, Formation (Rabbit) and Function
- **Unit-11: Biochemistry, Animal Physiology and Endocrinology**
 - Classification, structure and function of carbohydrates
 - Classification, structure and function of Protein
 - Classification, structure and function of lipids
 - Structure and function of Nucleic acid
 - Concept of pH and buffer and their biological significance
 - Enzymes - General properties, coenzymes, isoenzymes, allosteric enzymes, Mechanism of enzyme action^Factors affecting enzyme reaction
 - Heterotrophic Nutrition ; Intracellular digestion in Protozoa, Extracellular digestion in general, Cellular digestion in Termite, Cattle and Horse
 - Exchange of Gases: Respiratory pigments and their advantages, Oxygen and Carbon dioxide transport.
 - Excretion and Osmo-regulation: Urine formation in mammals; Nitrogen excretion in Ammonotelic, Ureotelic and Uricotelic animals, Osmo-regulation in Fresh Water and Marine Vertebrates
 - Physiology of Nerve Impulse conduction , Synaptic Transmission
 - Brief outline of organization and functions of endocrine system in mammals with special reference to: Pituitary, Thyroid and Gonads.
 - Reproductive Cycle (estrous cycle) and its hormonal control.

**Prescribed syllabus of Tripura University for
SEMESTER II Zoology (General) Practical
Paper 2B**

Total Marks = 50

1. Identification with reasons (Any five) **4x5 = 20**
 - a) *Paramecium, Sycon, Oboliva, Fasciola, Ascaris, Earthworm, Cockroach, Pila, Starfish, Branchiostoma, Ascidia, Petromyzon, Scoliodon, Labeo, Toad, Snake (Naja), Pigeon, Rat, Chiroptera.*
 - b) Identification of Cell division stages (Mitosis) with reasons. (Any one)
1x4=4
2. a) identification with characters of mammalian T.S. of Liver, Pancreas, Kidney, Thyroid, Testes, Ovary (any one)
b) Chick Emryo : 24 hrs, 48 hrs & 72 hrs (any one) **3+3 = 6**
3. Biochemistry: identification of Glucose, Starch & Protein.
Animal Physiology : Staining & Mounting of Human Squamous Epithelial tissue/BSood film . Preparation of buffer, determination of pH. **5x2 = 10**
4. Laboratory Note Book Submission & Viva Voce
5+5=10

Prescribed syllabus of Tripura University for Zoology (THEORY; GENERAL)

Semester III

Paper-3A

Full Marks: 50 (40 + 10)

Unit-I

Taxonomy & Classification, Evolution & Adaptation

Period - 20

1. Definition, Systematics, Taxonomy: Classification, Phenon. Taxon, Category, Binomial and Taxonomical nomenclature
2. Taxonomy Hieracrhy
3. Biological species concept
4. General characteristics and classification"
 - (i) Porifera, Cnideria & Annelida - up to -subclass
 - (ii) Amphibia & ReptiLia — up to order
5. Darwinism and post Darwinian synthetic theory of evolution
6. Selection: stabilizing, directional and disruptive selection with example: evolutionary significance of each kind of selection
7. Isolating mechanism and speciation (allopatric. sympatric and parapatric)
8. Morphological and physiological adaptation of- i. Camel, ii. Whale, and iii. Bat.
9. Animal colouration and mimicry ,

Unit - II

Ecology, Ethology, Zoogeography & Biodiversity'

Period - 20

1. Ecosystem: Definition, components,' energy flow, food chain, food web. ecological pyramids.
2. Population ecology: properties and growth form; population regulation
3. Community ecology: Species diversity, stratification of forest, trophic structures, babbit and niche concept
4. Community succession: characteristics, types and causes of ecological succession
5. Social insects (termites and honey bee) and their behavior
6. Types of animal distribution: cosmopolitan, discontinuous, endemism, bipolar
7. Barriers and their roles in animal, distribution
8. Zoogeographical realms: geographical range, physical features, fauna characteristics
9. Concept of biodiversity, causes of depletion of biodiversity: strategies of biodiversity conservation- *exsitu* and *insitu* methods.

Note: Internal assessment of 10 marks based on the above syllabus.

Prescribed syllabus of Tripura University for Zoology (PRACTICAL; GENERAL)

Semester III

Paper-3B

FULL MARKS: 50 (40 + 10)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1. Study of biotic community (Soil & Water) and their significance (any two) | 3x2=6 |
| 2. Determination of Population Density by Quadrate method | 6 |
| 3. Estimation of Dissolved Oxygen in-water and determination of pH | 6+2=8 |
| 4. Adaptive features of Physallia, Fasciola, Ascaris, Hirudinaria, Octopus, Exocoetus
Tree frog, Hemidactylus, Chiroptera. (any three) | 3x2=6 |
| 5. Field visit and submission of Field Note Book | 6 |
| 6. Practical Note Book | 4 |
| 7. Viva Voce | 4 |

Note: Internal assessment of 10 marks based on the above syllabus.

Prescribed syllabus of Tripura University for Zoology (THEORY; GENERAL)

Semester IV

Paper-4A

FULLMARKS (40 + 10)

Unit I: Applied Zoology II

1. Sericulture: Species of silk worms, food plants and silk varieties in India; Life history and rearing method of *Bombyx mori*, its diseases and control measures.
2. Apiculture: Species of honey bees in India; Life history and rearing methods of *Apis indica* Bee products and their uses.
3. Vermiculture: Major vermicomposting species in India; Principle, method and importance of vermicomposting.
5. Prawn culture: Indian prawns of commercial value - Penaeid and non-penaeid groups, Prawn culture and hazards in prawn farming.

Unit II: Genetics and Molecular Biology

1. Mendelian principle of segregation and independent assortment
2. Linkage, Recombination, Cytoplasmic inheritance
3. Concepts of alleles and multiple alleles
4. Sex determination in *Drosophila* and man; Sex chromatin or Barr body and its significance
5. Congenital chromosomal abnormalities: Down, Turner and Klinefelter syndrome
6. Mode of inheritance of autosomal and sex-linked genes with reference to albinism and colour blindness
7. DNA as a genetic material - experimental proof
8. Replication, Transcription and Translation in prokaryotes

Prescribed syllabus of Tripura University for Zoology (THEORY; GENERAL)

Semester IV

Paper-4A

Theory 60 (48 + 12)

Unit I: Microbiology, Parasitology and Immunology

- 1) General characters and major classification of microbes.
- 2) Microbes in human and animal welfare.
- 3) Common microbial diseases (Cholera and Amoebiasis), their treatment and control.
- 4) Life cycle, pathogenicity, clinical features and control measures of Plasmodium vivax, P. falciparum. Wuchereria bancroftii and Anchylostoma duodenale.
- 6) Host-parasitic interaction with reference to helminthes (Taenia sp. and roundworms) diseases.
- 7) Major cells types and organs of immune system; primary and secondary lymphoid organs: types of immune system: Cell mediated immune system & humoral immune system; Concept of antigens and types of antibodies

Unit II: Tools and techniques in Biology

(15 lectures) 12x2 = 24

- 1) Principle and applications of pH meter, ii) colorimeter, and iii) Centrifuges
- 2) Principle and applications of i) Chromatography ii) Electrophoresis
- 3) Principle and application of i) Light microscope (Bright-field and Phase Contrast) and Electron microscope (SEM & TEM)
- 4) Micro-techniques: Fixation, dehydration, embedding, block-making, microtomy, Principle of staining, acid and basic stains, Single & double staining methods

N.B: Internal assessment of 12 marks based upon above syllabus./

Prescribed syllabus of Tripura University for Zoology (PRACTICAL; GENERAL)

Semester IV

Paper-4B

FULL MARKS: 50 (40+10)

A. Applied Zoology

Spotting and economic importance of following specimens (any three)

- *Triporyza* sp.
- *Sitophilus* sp.
- *Bandicoota* sp.
- *Bombyx* sp.
- *Apis* sp.
- *Perionyx* sp.
- *Macrobrachium* sp.

B. Genetics

2. Preparation and staining of cell division (onion root tip)
3. Identification of Mitotic / Meiotic division stages
4. Studies of Barr body in man.

C. Viva Voce

D. Lab Note Book

Prescribed syllabus of Tripura University for Zoology (THEORY; GENERAL)

Semester V

Paper-5A

FULL MARKS: 50

Unit-I: Parasitology and Medical Entomology

(15 lectures)

1. Life cycle, pathogenicity, clinical features and control measures of-

(a) *Plasmodium vivax*

(b) *Entamoeba histolytica*

(c) *Ascaris lumbricoides*

2. Parasitic adaptations in helminthes with reference to *Ascaris lumbricoides* and *Taenia solium*

3. Common insect vectors related to public health: their features and the disease (s) caused by these vectors -

a) Mosquitoes (.Anopheles, Culex, Aedes)

b) House fly (Musca sp.)

c) Bed bug (Cimex sp.)

d) Head louse (Pediculus sp.)

Unit-11: Microbiology and Immunology

(15 lectures)

1. Types of Microbes and their important features.

2. Disease causing Microbes with reference to Cholera and Tuberculosis, mode of transmission.

3. Microbes in human gut and their beneficial role; concept of Probiotics.

4. Immune system - cells and organs of immune system, types of immune responses.

5. Antibodies types and its modal structure; antigen and antibody interaction.

Internal assessment of 10 marks based on the above study material

Prescribed syllabus of Tripura University for Zoology (PRACTICAL; GENERAL)
Semester V
Paper-5B

FULL MARKS: 50 (40+10)

1. Identification with reasons: (any two) 5x2=10
- a) *Entamoeba histolytica*
 - b) *Giardia intestinalis*
 - c) *Plasmodium Sp.*
 - d) *Ascaris lumbricoides*
 - e) *Culex sp.*
 - f) *Musca sp*
 - g) *Cimex sp.* 5
2. Adaptive features in *Fasciola sp.*, *Ascaris sp.*, *Taenia sp.*(any one).
3. Collection and preparation of gut fauna in cultivable fishes and fowl. 3+2+3 = 8
4. Submission of life history stages of mosquito in glass bottle & also on drawing sheet. 4+3 = 7
5. Lab Note Book. 5
6. Viva. 5

Internal assessment of 10 marks based on the above study material