DEPARTMENT OF ZOOLOGY

BRIEF HISTORY:

Zoology department has just taken birth in this year from 25th July, 2016 as the supportive department of Botany (Honours) and Chemistry (General).Here we are serving only the Zoology General course. We have a lot of future plans for the betterment of the teaching learning methods, and is hoping to implement those very shortly.

ACADEMIC CALENDER OF ZOOLOGY (GENERAL)

1ST YEAR GENERAL (PAPER- I) THEORY

TERM – I

- **GROUP- A : Functional Anatomy of Non- Chordates (LECTURES: 35)**

1. Classification with distinctive features and suitable examples of sub-kingdom Protozoa (up to Phylum) (Levine et al, 1980) and Phylum Porifera, Cnidaria, Platyhelminthis, Annelida, Arthropoda,
Mollusca and Echinodermata (up to Class)

2. General structure & function of the following with reference to the specimens mentioned:

(a) Locomotion –icrofibrils (*Amoeba*), Cilia *(Paramoecium)*
(b) Feeding & Digestion – Microphagy *(Amoeba)*, Macrophagy *(Periplanata)*
(c) Respiration – Ctenidium & Pulmonary sac *(Pila)*, gills (Prawn), Trachea (Cockroach)
(d) Excretion – Nephridia (Earthworm)
(e) Circulation – Open circulation (Cockroach), Closed circulation (Earthworm)
(f) Nervous system – Cockroach, Apple snail
(g) Reproduction – (a) Fission *(Amoeba)* (b) Budding *(Hydra)* (c) Conjugation (*Paramoecium*) (d)
Metagenesis in *Obelia*

[Scheme of classification other than Protozoa as per Ruppert and Barnes (1994), 6th Ed., Invertebrate
Zoology]

TERM – II

➢ GROUP – B: Cell Biology, Genetics and Molecular Biology (LECTURES: 35)

1. Fluid mosaic model of plasma membrane
2. Cell cycle check points
3. Physio chemical properties, types, structures and functions of DNA and RNA
4. DNA as a genetic material explanation with experiment
5. Mechanisms of replication, transcription and translation in *E. coli*
6. Linkage and recombination
7. Modes of inheritance of autosomal and sex linked genes in man (Thalassemia & Haemophilia, colour blindedness)
8. Sex determination in *Drosophila* (Genic Balance Theory only)

TERM – III

➢ GROUP – C: Developmental Biology (LECTURES: 30)

1. Spermatogenesis and Oogenesis
2. Fertilization in sea urchin
3. Types of eggs and cleavages, process of cleavage in *Amphioxus*
4. Gastrulation in *Amphioxus*
5. Extra-embryonic membranes in chick
6. Placenta types and function

2ND YEAR GENERAL (PAPER- II & III)

TERM – I

❖ THEORY : (PAPER – II)

➢ GROUP – A: Functional anatomy of Chordates (LECTURES: 35)

1. Classification of Phylum Chordata with distinctive features and suitable examples- up to living Subclass (Amphibia, Reptilia, Mammalia) ; up to subclass (Fishes and Aves) (Scheme of classification
as per J.Z. Young 1980, Life of vertebrates)

2. Functional anatomy- digestive system in *Oreochromis*, Circulatory system in *Columba*
3. Structure & function of the followings:
a. Integument – general structure & function, integumentary derivatives (scales in fishes, feathers

of *Columba*

b. Pharynx (*Branchiostoma*), stomach (*Bos*)

c. Respiratory structures and Respiration: Gill (Fish), lung and Air sac (*Columba*)

d. Circulatory structure and circulation: Single circuit heart (fish), double circuit heart (Amphibia and Mammals)

e. Nervous system – Brain in *Oreochromis*

f. Origin and distribution of cranial nerves in fish

❖ PRACTICAL : (PAPER- III)

➢ MODULE 1 : Demonstration (CLASSES: 10)

(i) Cockroach : digestive, nervous and female reproductive system

(ii) *Oreochromis* : digestive and urino-genital system

TERM – II

❖ THEORY : (PAPER – II)

➢ GROUP- B: Ecology, Animal behaviour, Biodiversity and Wildlife (LECTURES: 30)

1. Population – definition and growth
2. Community – definition and types
3. Basic concept of Biodiversity, Biodiversity hotspots
4. Honey bee – Hives, castes and their roles
5. Conservation of wild life – purpose & methods, concept of Biosphere Reserve, importance & Strategies of wildlife conservation, National Park & Wildlife Sanctuary
6. Basic idea of ecotoxicology and Xenobiotics
7. Climatic change - Global warming, acid rain, ozone depletion (cause and effect)

❖ PRACTICAL: (PAPER – III)

➢ MODULE 2 : Mounting and Preparation (CLASSES: 14)

(i) Mouth parts of cockroach

(ii) Cycloid and Ctenoid scale of fin fish
(iii)Haemolymph of cockroach (Leishman/Giemsa stain)
(iv)Gut contents of cockroach for protozoa (Fixation, staining and identification)
(v) Whole mount of aquatic and soil micro-arthropods
(vi)Epithelial cells from buccal smears with staining

- **MODULE 4 : Report on field study tours**

1. Zoological importance: Zoological garden or Museum

TERM – III

- **THEORY (PAPER – II)**

- **GROUP- C : Histology, Endocrinology, Animal Physiology & Biochemistry** **(LECTURES: 30)**

1. General characters of hormones: Naming and function of hormones secreted from Pituitary
2. Histology of Pancreas (theory)
3. Enzyme – Classification & characteristics, mechanism of enzyme action, effects of pH and Temperature on enzymatic action
4. Nerve impulse propagation &synaptic transmission
5. Osmoconformers and osmoregulators – definition and example, Osmoregulation in fishes

- **PRACTICAL : (PAPER – III)**

- **MODULE 3 : Identification with reasons (Systematic position up to taxon as mentioned in theory)** **(CLASSES: 10)**

(i) Bones: Skull, vertebrae, limb and girdle bones of *Columba*
(ii) Histological slides: Sections of mammalian liver, pancreas, testis, ovary and thyroid
(iii) Non- chordate specimens : *Paramoecium, Scypha,* Sea- anaemone, *Ascaris* (male & female), *Hirundinaria*, Scorpion, *Bombyx mori* (adult male and female), *Lamellidens, Pila, Loligo,* Starfish, *Balanoglossus*
(iv) Chordate specimens : *Amphioxus*, *Petromyzon*, *Scoliodon*, *Lates*, *Rhacophorus*, Axolotl larva,

Tylototriton, *Gekko*, *Hemidactylus*, Turtle, *Naja*, Chiroptera

3RD YEAR GENERAL (PAPER- IV)

TERM – I

❖ THEORY :

➢ GROUP – A : Applied Zoology (LECTURES: 30)

1. Sericulture: Life history and rearing of *Bombyx mori,* harvesting & processing of cocoon, reeling and
   Extraction of silk, diseases of worms of *Bombyx mori* and control measures
2. Aquaculture: Principles, definition and scope, Exotic fishes – their merits and demerits, Basic Principles of different aquaculture system (Polyculture and integrated farming), culture of prawn
3. Pest and Management: a) Definition and types of pests with examples; Life history, behaviour, ecology, damage and control of the following pests: i) Paddy *Scirpophaga* (*Syn*. *Tryporyza*) *incertulus*, ii) Stores grain – *Sitophilus oryzae,* iii) Mammalian pest (*Bandicota bengalensis*)
4. Apiculture: Development of Apiary in India; Types of honey bees, modern methods of apiary management, products and its uses, problems and prospects
5. Poultry: fowl – types of breeds, rearing and disease management

❖ PRACTICAL :

➢ GROUP – D : Laboratory course (CLASSES: 12)

- **MODULE 1 :**

1. Experimental works
   a. Estimation of dissolved O2 content of water **or** Estimation of free CO2 content of water
   b. Pedigree analysis: sex linked recessive, autosomal recessive and dominant
   c. Determinant of ABO blood group & Rh factor in man **or** Measurement of water pH and handling of pH meter

TERM – II

❖ THEORY :

➢ GROUP – B : Parasitology & Immunology (LECTURES: 20)

1. Parasitism (definition and types) and other inter- specific interactions (symbiosis, commensalism and mutualism)
2. Life history, Pathogenecity and Clinical features of i) *Entamoeba histolytica,* ii) *Plasmodium vivax*
   iii) *Ascaris*
3. Outline structure and classification of immunoglobulin, antigen- antibody reaction

- **PRACTICAL:**

- **GROUP – D : Laboratory course**
  - **MODULE 2 : Field training**

TERM – III

- **THEORY:**

- **GROUP – C : Evolutionary Biology (LECTURES: 20)**

1. Definition of systematics & taxonomy
2. Species as a unit of evolution (definition and types: biological, sibling and polytypic species)
3. Chemical basis of origin of life
4. Anatomical and Physiological adaptations: Aquatic (fish), Desert (Camel) and Volant (Pigeon) Animals
5. Zoogeographical realms (Wallace scheme) with characteristic mammalian fauna

- **PRACTICAL :**

- **GROUP – D : Laboratory course (CLASSES: 2)**
  - **MODULE 3 : Identification (Write specimen characters and applied importance)**

Taenia solium, Scirpophaga (Syn. Tryporyza) incertulas, Sitophilus oryzae, Epilachna, Lepisma, Termite queen*, Bandicota bengalensis, Labeo rohita, Catla catla, Cyprinus carpio, Tenualosa (Hilsa) ilisha, Penaeus sp. , Macrobrachium rosenbergi*