

SUBJECT ZOOLOGY
4 YEAR UG SYLLABUS_CBPBU
MAJOR-1
Animal Diversity: Non-Chordates and Chordates

OBJECTIVES:

- Study the detailed scheme of classification of the animal world to gain deep insight regarding the unique characteristic features representing each phylum.
- To study some of the unique features of each taxonomic group of non-chordate and chordates for better understanding of the structural and functional patterns based on their evolutionary relationship.

DIFFICULTY LEVEL: 100 MODE OF INSTRUCTION: LPT

THEORY
(CREDITS 4)

Group A: Non chordates

1. Body symmetry in invertebrates; Coelom: origin and types.
2. Classification with reasons and examples- Protozoa: up to phyla, other non-chordates (upto Phylum Echinodermata): from phyla to living sub-classes.
[*Classification of invertebrates to be followed from Invertebrate Zoology by Ruppert and Barnes VI edition (1987, 1994) Saunders College Pub, except for Protozoa (American Association of Protozoologist ref: Levine 1980) and Porifera (Brusca and Brusca 2002; IV edition. Invertebrate Zoology)*].
3. Reproduction in *Paramoecium* sp. with special reference to conjugation.
4. Canal system in Porifera.
5. Coral reef: Types, coral reef formation, distribution, importance, and conservation of coral reefs.
6. Respiration in Arthropoda: Structure and mechanism of respiration through gills, book lungs and trachea.
7. Onychophora: Affinities, systematic position and evolutionary significance.
8. Nervous system in *Pila* and the significance of torsion on it. Nervous system in *Aplysia* and the significance of detorsion on it.

9. Water vascular system in *Asterias* sp.

Group B: Chordates

1. Basic body plan in chordates.
2. Basic concept of chordate classification. Classification up to living subclasses of Fish, up to living orders of Amphibia and Reptilia; up to infra-classes of Mammals [according to J. Z. Young 1981 except fish (Talwar and Jhingran,1991)]
3. Salient features of *Balanoglossus* sp. and its affinities.
4. Retrogressive metamorphosis in *Ascidia* – justification in the light of survival of the species.
5. Structure of pharynx and feeding mechanism in *Branchiostoma* sp.
6. Agnatha: General characteristics and classification of cyclostomes up to classes.
7. Accessory respiratory organs in fishes.
8. Neoteny and paedomorphosis with special reference to Axolotl larva.
9. Non-poisonous and poisonous snakes; Poison apparatus and biting mechanism of poisonous snake; Dos and don'ts after snake bite; types of venom; antivenom-Indian perspective.
10. Feather of birds-types; Principles of aerodynamics in bird flight.
11. Dentition in mammals-types, structure, and cycle of replacement; Echolocation in bats.

PRACTICAL (CREDITS 2)

1. Identification with reasons following specimens (Preserved specimens/models/photographs as available to be used):

Non-Chordates: *Amoeba, Paramoecium, Euglena, Scypha, Hydra, Obelia, Aurelia, Metridium, Taeniasolium, Fasciola, Ascarislumbricoides, Nereis, Pheretima, Chaetopterus, Hirudinaria, Macrobrachium, Squilla, Hippa, Balanus, Lepas, Cyclops, Daphnia, Periplaneta, Locust, Leptocoriza, Scorpion, Limlus, Julus, Scolopendra, Peripatus, Chiton, Aplysia, Pila, Achatina, Lamellidens, Loligo, Sepia, Octopus, Asterias, Echinus, Cucumaria.*

Chordates: *Balanoglossus, Branchiostoma, Ascidia, Petromyzon, Myxine, Scoliodon, Trygon, Narchine, Labeo, Catla, Cirrhina, Channa, Anabus, Heteropneustes, Clarias, Ichthyophis, Necturus, Bufo, Hyla, Tylototriton, Hemidactylus, Chamaeleo, Draco, Naja, Columba, Ornithorhynchus, Cavia.*

2. Study of following Permanent Slides (Permanent slides/photographs as available to be used):

CS of sponges (syconoid and leuconoid), LS of *Metridium*, CS of *Ascaris* (male &female) through gonadal region, CS of *Pheretima*.

Larvae: trochophore, glochidium, nauplius, echinopluteus, axolotl.

3. Staining/slide Preparation/dissection/mounting:

Hydra, *Obelia* colony, *Cyclops*, *Daphnia*, *Tubifex*, digestive system of cockroach, mouth parts of cockroach, cycloid and ctenoid scales, hyoid apparatus and pecten of fowl.

4. Key for Identification of poisonous and non-poisonous snakes.

PROJECT

Suggestion: Students can submit insect box or bone box (disarticulated)- It can be assigned as a group activity.