

OBJECTIVES:

1. To gain knowledge about the concepts of Bio-Systematics.
2. To Learn about Developmental biology
3. To understand the morphology and anatomy of chordates.

UNIT – I: GENERAL CHARACTERS OF CHORDATA

PROCHORDATA

1. Salient features of Cephalochordata
2. Structure of *Branchiostoma* (*AMPHIOXUS*), larva of *amphioxus*.
3. Affinities of Cephalochordata
4. Salient features of Urochordata
5. Structure and life history of *Herdmania*
6. Significance of Retrogressive metamorphosis

UNIT – II:

CYCLOSTOMATA

1. General characters of Cyclostomes
2. Comparison of the *Petromyzon* and *Myxine*

PISCES

1. General characters of Fishes
2. Classification of fishes up to subclasses with examples
3. *Scoliodon* - External features, Digestive system, Respiratory system, Heart, Brain
4. Migration in Fishes
5. Types of Scales
6. Dipnoi

UNIT – III:

AMPHIBIA

1. General characters of Amphibia.
2. Classification of Amphibia upto orders with examples.
3. *Rana hexadactyla* - External features, Digestive system, Respiratory system, Heart, Brain.
4. Parental care in Amphibia.

REPTILIA

1. General characters of Reptilia
2. Classification of Reptilia upto orders with examples
3. Calotes - External features, Digestive system, Respiratory system, Heart, Brain
4. Identification of Poisonous snakes.
5. Poison apparatus and biting mechanism in poisonous snakes.
6. Skull in Reptiles.

UNIT – IV:**AVES**

1. General characters of Aves
2. Classification of Aves upto subclasses with examples.
3. *Columba livia* - External features, Digestive system, Respiratory system, Heart, Brain
4. Migration of Birds
5. Flight adaptation of birds.

MAMMALIA

1. General characters of Mammalia
2. Classification of Mammalia upto sub classes with examples
3. Comparison of Prototherians, Metatherians and Eutherians
4. Dentition in mammals
5. Aquatic mammals and their adaptations.

UNIT- V**DEVELOPMENTAL BIOLOGY**

1. Gametogenesis (spermatogenesis, oogenesis)
2. Fertilization
3. Parthenogenesis (Haploid and Diploid).
4. Types of eggs.
5. Types of cleavages.
6. Development of Frog upto formation of primary germ layers.
7. Formation and functions of Foetal membrane in chick embryo
8. Development, types and functions of Placenta in mammals.

TEXT BOOKS:

1. Modern Text book of Zoology – vertebrates by R.L.Kotal – Rastogi Publications, Meerut – 25002, Edition 2004 -2005.
2. Manual of Zoology – Vol II by Ekambaranatham – Madras – V Edition (1985)
3. A Text Book of zoology – vol II by P.S.Dhami&J.K.DhamiPradeep publications, Delhi; Edition 1992.
4. Introduction to chordates by MajpuriaTrilok Chandra – S.Nagin& Co – Jallundhar 1974.
5. Chordate embryology by P.S.Verma, V.K.Agarwal&B.S.Tyagi, S.Chanda& Company Ltd Delhi, edition – 1994.

REFERENCE BOOKS:

1. A Text Book of Zoology – vol II by T.Jefferyparkar and William Haswell – CBS publishers & Distributors – Delhi 7th edition.
2. The Cambridge Natural History – vol VI & VII by SS.F.Harmer&A.E.Shipley – wheldon& Wesley ltd. England – 1968.
3. A Text Book of chordate embryology by Dr. R. C. Dalela& Dr. S. R. Verma- Jai prakash& co. Meerut city. v.p. Edition 1983
4. Modern Zoology by Dr. Ramesh Gupta – Prakash publications, Muzaffarnagar -v.p. Edition 1993 – 1994
5. A Text Book of chordate zoology by R.C.Dalela – Jai PrakashNath publications. Meerut. Edition 1998.
6. Development Biology by Dr.K.V.Satry& Dr. VineetaShukal. Rastogi publications. Meerut – 250002, Edition .2004.

MAJOR DISSECTIONS (Demonstration only)

SHARK : 1. Arterial System, 2. 5th & 7th Cranial Nerves.

MINOR DISSECTIONS / MOUNTINGS: (Demonstration only)

SHARK : 1. Brain 2. Placoid Scales. 3. Primitive streak 4. 24 hrs chick embryo.

SPOTTERS:

PROCHORDATA: Amphioxus (Entire), T.S. of Amphioxus through Pharynx, Tail; larva of Amphioxus; Ascidia, Ascidian Tadpole.

PISCES : Petromyzon, Ammocoetus Larva, Myxine, Zygaena, Trygon or Torpedo, Narcine, Pristis, Echeneis, Cynoglossus, Rastrelliger, Tetradon, Hippocampus (Male & Female), Exocoetus, Anguilla or Muraena, Labeo, Catla, Clarius. - placoid scale, cycloid scale, ctenoid scale.

AMPHIBIA: Bufo, Hyla, Alytes, Necturus, Triton (newt), Salamandra (ambystoma), Axolotyl Larva, Ichthyophis with eggs.

REPTILIA: Draco, Chameleons, Varanus, Mabuya, Phrynosoma, Dryophis, Russell's Viper, Hydrophis or Enhydrina, Bungarus (krait), Cobra, Testudo, Trionyx, Lissemys.

AVES: Athena brama, Anas, Alcedo, Passer domesticus, Corvus splendens, Acridothera tristis, Psittacula, Columba livia, Merops (bee eater), Upupa epops, Pycnonotus (bulbul) .

MAMMALIA: Funambulus, Macaca, Pteropus (bat), Crocidura (shrew), Rattus, Hystrix (Porcupine), Manis, Herpestes (mongoose), Echidna or (spiny anteater), Ornithorhynchus (duckbilled platypus), Loris (monkey).

OSTEOLOGY: Lower Jaw and Girdles of Frog, Vertebrae and limbs of Frog.

Skulls of Calotes, Pigeon and Rabbit. Vertebrae of Pigeon and Rabbit.

Limbs and Girdles of Calotes, Pigeon and Rabbit.

EMBRYOLOGY : Blastula & gastrula of frog, Yolk plug of frog.

Hen's egg, Primitive streak, 24 hrs, 48 hrs chick embryo.

