

## Core IX

## Comparative Anatomy of Vertebrates

### Programme Outcome:

- Understand anatomical significance of organ system in vertebrates.
- Comprehend structure, function and various derivatives of Integumentary, Skeletal, digestive, respiratory, circulatory, urinogenital and nervous system.

### Course Outcome:

- Learner gains detailed overview of the anatomical resemblance amongst vertebrates hierarchies.
- Acquires knowledge on cellular development of organ systems in the vertebrates and linear progression of cellular derivatives during organogenesis.
- Understand the process of linear and vertical cellular evolutionary processes.

### Learning Outcome:

- Acquire knowledge of the integument, and skeleton systems.
- Gain knowledge on the Gastro intestinal canal, associated glands, and respiration system.
- Obtain knowledge of the Circulatory and Urinogenital systems and their evolution.
- Comparative study of mammalian nervous system & sense organs.

### Unit 1: Integumentary & Skeletal System

Structure, functions and derivatives of integument (Scale, claw, nail, hair, feather and dentition). Axial and appendicular skeleton, Jaw suspensorium, Visceral arches.

### Unit 2: Digestive & Respiratory System

Alimentary canal and associated glands; Respiration through Skin, gills, lungs and air sacs; Accessory respiratory organs.

### Unit 3: Circulatory and Urinogenital system

General plan of circulation, evolution of heart and aortic arches; Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri.

### Unit 4: Nervous System & Sense Organs

Comparative account of brain; Nervous system, Spinal cord, Cranial nerves in mammals. Classification of receptors: Brief account of visual and auditory receptors in man. Chemo and mechano-receptors

## Practical

1. Study of placoid, cycloid and ctenoid scales through permanent slides/photographs
2. Disarticulated skeleton of Frog, Varanus, Fowl, Rabbit.
3. Carapace and plastron of turtle /tortoise (Photographs, charts etc).
4. Mammalian skulls: One herbivorous and one carnivorous animal.
5. Study of structure of any two organs (heart, lung, kidney, eye and ear) through ICT tools.
6. Project report submission on Integumentary derivatives.

### Text Books:

- ✓ Kardong, K.V. (2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education
- ✓ Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition. The McGraw-Hill Companies
- ✓ R. K. Saxena and Sumitra Saxena (2016). Comparative Anatomy of Vertebrates 2nd edition.

### Suggested Readings:

- ✓ *Hilderbrand, M and Gaslow G.E. Analysis of Vertebrate tructure, JohnWiley and Sons*
- ✓ *Walter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House*