

ZOS403: COMPARATIVE ANATOMY

Teaching Hours 10/Unit

COURSE OUTCOME

1. Comparative anatomy explores and establishes the correspondences between body parts of organisms from different species.
2. It builds the concepts of the living structures and helps to propose homology hypotheses between different organs.
3. Students are guided to understand the anatomy of different organ systems of organisms including invertebrates.
4. Contents of this course highlights the importance of anatomical structures to assess comparative study from lower to higher vertebrates.
5. It is the study of both the functional adaptation, which plays the main role, and the phylogeny.
6. Learners focus on methods and different tools used in anatomical studies.

UNIT I

Historical perspective and general concepts of Comparative Anatomy, Anaplasia, Homoplasia. Body plan of animals-evolutionary perspectives. Body plan of protochordates –their affinities with invertebrates and chordates, Origin of vertebrates – major life forms, Methods and tools used to study animal body

UNIT II

Excretory organs- Organs of excretion among invertebrates; Gross anatomy development and evolution of kidneys. Structure of the nephron in relation to excretion and osmoregulation. Respiratory structures - General structure and types of internal gills; External gills; Lungs and gas bladder of fishes; Evolution of lungs from amphibians to mammals. Respiratory structures among invertebrates. Reproductive system of vertebrates

UNIT III

Circulation - Heart of vertebrates-evolutionary modifications; Evolution of major aortic and venous channels of vertebrates. Organization of the vascular system in invertebrates. Digestive tract- General organization and microscopic structure of the gut of vertebrates. Adaptive features of the digestive tract of vertebrates- evolutionary perspectives; General organization of the digestive tract of invertebrates.

UNIT IV

Integument- Gross anatomy of Integument of vertebrates and their derivatives. Skeleton - Components of the head skeleton; Principal types of jaw suspensions; Cranial kinesis; General structure of vertebrae; evolution of paired appendages, pectoral and pelvic girdles of vertebrates ; Ribs and sternum of fishes and tetrapods. Muscles- Gross structure of muscles; muscles of primary swimmers. Axial, Hypobranchial, Appendicular and Branchial muscles of tetrapods.

UNITV

Nervous system- General organization of the nervous system in animals; Comparative account of brain and evolution of telencephalon; Cranial nerves of vertebrates. Sense organs- Eye, ear, olfactory organs, Lateral line. Nervous system and electroreceptors of vertebrates. Photoreceptors and chemoreceptors of insects.

REFERENCES

1. Barnes, R.S.K. (1993) The invertebrates: a new synthesis, Blackwell Scientific Publication.
2. Cleveland, H.P., Roberts, Larry S. (Jr) and Larson A. (1995) Integrated Principles of Zoology. 9th edition, WBC Brown publishers.
3. Gardiner, M. S. (1972) The Biology of Invertebrates, Mc. Graw Hill Book Co.
4. Hyman L. H. (2004) Anatomy of Comparative Vertebrates. Reprint. Satish Serial Publishing, Delhi.
5. Kenneth, V. K. (2006) Vertebrates: Comparative Anatomy, Function, Evolution. 4th edition, McGraw-Hill, New York, NY.
6. Kulshrestha, S. K. (2004) Comparative Anatomy of Vertebrates
7. Milton, H. (1995) Analysis of vertebrate structure. John Niley & Sons Inc, New York.
8. Romer, A.S and Parsons T. S. (1978) The Vertebrate body, 5th edition, W.B. Saunders Co & Toppan Co, Ltd
9. Saxena, R.K. and Sumitra S. (2008) Comparative Anatomy of Vertebrates. New Delhi,
10. William, K.P. (1998) Life- The Science of Biology, 5th edition, Sinauer Associates Inc.

