ZOS403: COMPARATIVE ANATOMY

Teaching hours **10hrs /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. A content 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

Protochordates and chordates: Historical perspective and general concepts of Comparative Anatomy, Anaplasy, Homoplasy. Body plan of animals-evolutionary perspectives.Characters and Classification of proto-chordata, significance of protochordates in the evolution.Origin of chordates and classification.Methods and tools used to study animal body.

UNIT-II

Integument, Skeletal and Digestive system**:** Vertebrate integument, development, structure of skin in vertebrates. Derivatives of Integument glands, scales, horns, claws, hooves, feathers & hair. Skeleton - Components of the head skeleton. Comparative account of jaw suspension. Cranial kinesis, Comparative account of vertebral column. Comparative account of girdles and limbs. Anatomy of gut in relation of feeding habits- herbivores, carnivores and omnivores.

UNIT-III

Circulation and respiration: Evolution of heart in vertebrates. Evolution of aortic arches and portal system. Respiratory organs in fishes-Internal and External gills, Lungs and gas bladder. Air sacs in birds. Evolution of lungs from amphibians to mammals.Respiratory structures among invertebrates.

UNIT-IV

Nervous and muscle systems: Comparative anatomy of brain in relation to its function. Nerves - cranial, peripheral and Autonomous nervous system. Sense organs-eye, organs of olfaction and taste, Lateral line system and Electric organs. Muscles- Gross structure of muscles; muscles of primary swimmers.Axial, Hypobranchial, Appendicular and Branchial muscles of tetrapods.

UNIT-V

Urino-genital systems: Excretory organs- Organs of excretion among invertebrates.Gross anatomy, development and evolution of kidneys in vertebrates.Structure of the nephron in relation to excretion and osmoregulation. Reproductive system in Vertebrates.

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. 9 the dition, 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, 5thedition, 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.