

Evolution, Developmental Biology and Environmental Biology

Course Code: BEB 209

Contact Hours: 60

Credit: 04 (L-3, T-1, P-0)

MM: 100

• Course Objective

- 1. To introduce the different anatomical feature of animals and its significance.
- 2. To learn the comparative account of anatomy of vertebrates.
- 3. To explore the evolutionary background of different physiological advancement in different animal groups.
- 4. To study the anatomical adaptations of animals in relation to their habit and habitat.
- 5. To learn the workability of major organs and organ systems of animals.
- 6. To study the basic principles and methodology of histology.

Unit 1 Anatomy of integumentary, digestive and respiratory system: Integument and its derivatives, endoskeleton - axial skeleton & appendicular skeleton Digestive system – Alimentary canal and associated glands, respiratory system – cutaneous respiration, Gills and lungs, Air sacs in birds.

Unit 2 Anatomy of circulatory, excretory and nervous system: Circulatory system – evolution of heart and aortic arches, portal systems, excretory system – kidney and its ducts, Nervous system – Comparative anatomy of Vertebrate brain, Structure of neuron, Sense organs – Comparative anatomy of ear and eye.

Unit-3 Basic processes of development: Gametogenesis: Spermatogenesis and oogenesis w.r.t. mammals, vitellogenesis in birds; Fertilization: external (amphibians), internal (mammals), blocks to polyspermy; Early development of frog and humans (structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula); types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo.

Unit-4 Late embryonic development: Implantation of embryo in humans, Formation of human placenta and its functions, other types of placenta on the basis of histology; Metamorphic events in frog life cycle and its hormonal regulation.

Unit-5 Applied developmental biology: Medical implications of developmental biology: Infertility – Diagnosing Infertility, IVF, Teratogenesis: teratogenic agents and effect of teratogens on embryonic development

Suggested readings

Comparative Anatomy

- 1) Carter, G.S. Structure and habit in vertebrate evolution – Sedgwick and Jackson, London.
- 2) Kingsley, J.S. Outlines of Comparative Autonomy of Vertebrates
- 3) Kent, C.G. Comparative anatomy of vertebrates
- 4) Smith, H.S. Evolution of Chordata structure. Hold Rinchart and Winstoin Inc. New York.
- 5) Walter, H.E. and Sayles, L.D. Biology of vertebrates, MacMillan & Co. New York.
- 6) Outlines of comparative anatomy, Romer & Parsons, Central Book Depot, The Vertebrate Body (Saunders)

Developmental Biology

- 1) Balinsky – Introduction to Embryology
- 2) Gilbert- Embryology
- 3) Jain – Embryology
- 4) Tyagi, Agarwal- Embryology
- 5) Mohan P Arora- Embryology
- 6) Sastri, Singh, Tamar-Cell and Developmental biology.


Course Outcomes:


After completing the course, the students will be able to:

1. Describe basic anatomy of different groups of animals.


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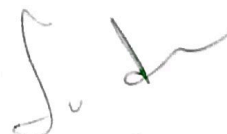
2. Identify specific characteristics of individual group of animals.
3. Determine physiological significance of various organs and organ systems in animals.
4. Understand the origin and advancement of anatomical features of animals
5. Discuss and compare the functioning of different organ system found in animals.
6. Apply histological principles and methodologies to analyze the internal structure of various organs of animals.



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