

Bachelors with Zoology as Major

3rd Semester

ZOL322J: Zoology: Comparative Anatomy of Vertebrates

Total Credits: 4 Theory, Practicals-2

Course objective: This course is designed to give a learner the fundamental understanding of the structure of organ systems of vertebrates so as to lay a strong foundation in understanding their life processes **Learning outcome:** After the completion of course, a student should be able to understand the structure of different organ systems in vertebrates and shall become a subject expert in animal anatomy

Theory: (4 Credits)

Unit I: Integument & its Derivatives

General structure of skin; comparative structure of integument in vertebrates
Derivatives of integument: scales, beaks, horns, digital tips- claws, hoofs & nails
Feathers- structure & types; hair- structure & development
Epidermal glands: mucous, preening, sweat, sebaceous & mammary glands

Unit II: Digestive & Excretory system

Digestive system: structural organization of gastrointestinal tract and its associated glands
Teeth: development, structure & types; dental formula in Mammals
Excretory system: kidneys-structure & position; urinary ducts, bladders; structure of nephrons
Evolution of kidney

Unit III: Circulatory & Respiratory system

Circulator system- nature & types; heart -structure & types; blood vessels- structure & development
Formation & composition of blood & lymph
Respiratory system: structure of gills, lungs & air sacs; accessory respiratory organs
Origin and phylogeny of lungs

Unit IV: Life controlling & coordinating systems

Nervous system: CNS & PNS; sense organs- eye & ear
Endocrine system: endocrine glands-structural organization & histology
Skeletal and muscular system
Male & female reproductive systems

Practicals: (2 Credits)

Section I:

1. Preparation of temporary mounts or slide study of placoid, cycloid and ctenoid scales
2. Demonstration of feathers, claws, hooves etc., & their types
3. Slide study of sections of different organs: oesophagus, stomach, duodenum, ileum, liver, lung, kidney etc., as per availability
4. Slide study of sections of skin, mammary glands, pituitary, pancreas, testis, ovary, adrenal, thyroid and parathyroid glands as per availability

Section II:

1. Dissections: alimentary canal & cranial nerves of scoliodon / fish / fowl, as per availability
2. Study of various organ systems in fish / fowl / rat
3. Dissection of eye and brain of sheep to show their different parts
4. Study of kidney, heart, brain through charts / models

Suggested books:

1. Chordate Zoology by E. L. Jordan P. S. Verm. S. Chand and company, New Delhi
2. Life of Vertebrates by J. Z. Young New York Oxford University Press.
3. Text Book of Zoology Vol-11 Porcker and Haswel AZTBS Publishers New Delhi
4. The Vertebrate Body by Romer and Parso Saunders Company
5. Chordate Zoology by P S Dhami J K O Howu / Pradeep Publications, Jalandhar
6. Modern Text Book of Zoology (Vertebrates) R L Kotpal Rastogi Publications
7. Comparative Anatomy of Vertebrates K.K. Saxena and Saxena Viva Books Pvt. Ltd.
8. Introduction to the Comparative Anatomy of Vertebrates M. L. Sirivatava
9. Comparative Anatomy of Vertebrates G.C. Kent and R.K. Carr
10. Manual of practical Zoology Chordates P S Verma S. Chand and Company Ltd.