

KOLHAN UNIVERSITY, CHAIBASA



Proposed Syllabus for FYUGP, NEP-2020 B.Sc. (Hons.) Zoology (Effective from Academic Year 2022-23 onwards)

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Semester II

Major Paper 2 (MJ 2) : Diversity of Chordates

Theory (03 Credits): **45 hours**

UNIT I: Introduction to Chordates **2 hours**

General characteristics and outline classification of Chordates.

UNIT II: Protochordata **6 hours**

Specific characteristics of Hemichordata, Urochordata and Cephalochordata; Retrogressive metamorphosis in Urochordata

UNIT III: Origin of Chordates **2 hours**

Dipleurula concept and the Echinoderm theory of origin of chordates

UNIT IV: Agnatha **2 hours**

Specific characteristics of Agnatha and classification up to Class

UNIT V: Pisces **6 hours**

Specific characteristics of Pisces*, Classification up to class, Migration and Osmoregulation in Fish

*Comparative account or difference between classes should be discussed and emphasis also will be given to lateral line system.

UNIT VI: Amphibia **6 hours**

Origin of Tetrapoda, Amphibia: Specific characteristics and classification up to order; Introduction to Parental care in Amphibians

UNIT VII: Reptilia **6 hours**

Reptilia: Specific characteristics and classification up to order; Poison apparatus, feeding and biting mechanism in snakes

UNIT VIII: Aves **6 hours**

Aves: Specific characteristics and classification up to order; Flight adaptations and migration in birds

UNIT IX: Mammals **6 hours**

Mammals: Specific characters and classification up to order, Adaptive radiation with reference to locomotory appendages

UNIT X: Zoogeography**3 hours**

Zoogeographical realms, Distribution of vertebrates in different realms

Recommended Readings:

- Young, J. Z. (2004) The Life of Vertebrates. III Edition. Oxford university press.
- Hickman, C.; Roberts, L.S.; Keen, S.L.; Larson, A. and Eisenhour, D. (2018) Animal Diversity, McGraw-Hill.
- Holland, P. (2011) The Animal Kingdom: A Very Short Introduction, Oxford University Press.
- Darlington P.J. (1966). The Geographical Distribution of Animals, R.E. Krieger Pub. Co.

Major Paper 3 (MJ 3) : Comparative Anatomy of Vertebrates

Theory (03 Credits): **(45 hours)**

UNIT I: Integumentary System **5 hours**

Structure and derivatives of integument, functions of skin.

UNIT II: Skeletal System **12 hours**

Outline of axial and appendicular skeleton (tetrapod): basic plan of bones of skull, girdles and limbs. Classification of vertebrae, structure of a typical vertebra (basic layout), Jaw suspensorium, Visceral arches.

UNIT III: Digestive System **4 hours**

Alimentary canal and associated glands, dentition.

UNIT IV: Respiratory System **4 hours**

Skin, gills, lungs and air sacs; Accessory respiratory organs.

UNIT V: Circulatory System **6 hours**

General plan of circulation, Evolution of heart and aortic arches.

UNIT VI: Urinogenital System **6 hours**

Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri.

UNIT VII: Nervous System **5 hours**

Comparative account CNS, PNS, ANS with special emphasis on brain (from formation to partitioning); Cranial nerves in mammals.

UNIT VIII: Sense Organs **3 hours**

Classification of receptors (organ of special senses); Brief account of visual and auditory receptors in man.

Recommended Readings:

- Kardong, K.V. (2005). Vertebrate's 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.
- Leiem C.F., Bermis W.E, Walker, W.F, Grande, L. (2001). Functional anatomy of the vertebrates, An evolutionary perspective. III Edition, Brookes/Cole, Cengage Learning.

- C.K Weichert and W. Presch (1970). Elements of Chordate Anatomy, IV Edition, McGraw- Hill.
- Pough.H. (2018). Vertebrate Life.X Edition. Pearson International.

MJ 2 (Practical) (02Credits):**(60 hours)****(Based on theory papers MJ2 and MJ3)**

1. Study of following specimens: *Balanoglossus*, *Herdmania*, *Branchiostoma*, *Petromyzon*, *Myxine*, *Scoliodon*, *Pristis*, *Torpedo*, *Labeo*, *Exocoetus*, *Anguilla*, *Ichthyophis*, *Salamandra*, *Bufo*, *Hyla*, *Chelone*, *Chamaeleon*, *Draco*, *Vipera*, *Naja*, *Crocodylus*, Any three common birds from different orders, *Bat*, *Loris*.
2. Key for identification of poisonous and non-poisonous snakes on the basis of tail, scales, fangs, nature of venom and other morphological features.
3. Types of beaks and claws in birds.
4. Study of placoid, cycloid and ctenoid scales of fish through temporary mounts/permanent slides/photographs.
5. Study of different types of feathers of birds through demonstrations/photographs.
6. Comparative Osteology: Disarticulated skeleton of Frog, *Varanus*, Fowl, Rabbit (Limb bones, Girdles).
7. Study of carapace and plastron of turtle/tortoise through specimen/ model/photographs.
8. Submission of project report on study of animals in nature during a survey of a National Park/ Biodiversity parks/ Zoological Museum.
9. Group discussion or Seminar presentation from any topic from the paper.

Pattern of Examination:**50 Marks**

1. Spotting
 - a. (6 specimens × 2 marks) (12 Marks)
 - b. Osteology- at least one from each class (8 Marks)
2. Key for Identification of poisonous and non-poisonous snakes. (3 Marks)
3. Types of beaks and claws in birds (3 Marks)
4. Scales (1) and Feathers (1) Identification (5 Marks)
5. Carapace/Plastron Identification (4 Marks)
6. Visit Report (5 Marks)
7. Practical record (5 Marks)
8. Viva-voce (5 Marks)