

KOLHAN UNIVERSITY, CHAIBASA



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

Draft Prepared by:

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Semester I

Major Paper 1 (MJ 1) : Systematics and Diversity of Life- Protists to Chordates

Credits: Theory:04
Practical: 02
Total: 06

Theory (04 Credits):

UNIT I: Origin of Life on Earth, Products of evolutionary process 15 hrs

Origin of life on Earth: Arrival of simple form from primordial chemicals. Multicellularity: from simple collections of poorly differentiated cells to complex body plans. Biological diversity. Systematics and taxonomy. Species concept, clades. Nomenclature and utility of scientific names. Classification: morphological and evolutionary (molecular). Relationship of taxa: phylogenetics and cladistics.

UNIT II: Diversity in Protists and acoelomate Metazoa 15 hrs

General Characteristics of Kingdom Animalia and Basis of Classification, Protista: General characteristics and Classification up to classes; Locomotion and Reproduction in Protista, Porifera: Introduction to Parazoa; General characteristics and Classification up to classes; Canal system in sponges, Introduction to Metazoa: Cnidaria: General characteristics and Classification up to classes; Metagenesis in Obelia; Polymorphism in Cnidaria; Corals and coral reefs. Ctenophora: General characteristics and evolutionary significance, Platyhelminthes: General characteristics and Classification up to classes; Parasitic adaptations in Platyhelminthes.

UNIT III: Diversity in pseudocoelomate and coelomate Non chordates 15 hrs

Pseudo coelomates: General characteristics and Classification up to classes; Parasitic adaptations in Nematelminthes. Evolution of coelom and metamerism. Annelida: General characteristics and Classification up to classes; Excretion in Annelida; Arthropoda: General characteristics and Classification up to classes, Vision and Respiration in Arthropoda; Onychophora: General characteristics and Evolutionary significance, Mollusca: General characteristics and Classification

up to classes; Torsion and detorsion in Gastropoda; Pearl formation in bivalves. Echinodermata: General characteristics and Classification up to classes; Water-vascular system in Asterozoa.

UNIT IV: Diversity in Protochordates and Chordates

15

hrs

Chordates: General characteristics and outline classification. General characteristics of Hemichordata, Urochordata and Cephalochordata; Retrogressive metamorphosis in Urochordata. General characteristics and classification of cyclostomes up to Class; Pisces: General characteristics of Chondrichthyes and Osteichthyes, Classification up to order, Migration and Osmoregulation in Fish. Origin of Tetrapoda, Amphibia: General characteristics and classification up to order; Parental care in Amphibians. Reptilia: General characteristics and classification up to order; Poison apparatus and biting mechanism in snakes, Aves: General characteristics and classification up to order; Flight adaptations and migration in birds, Mammals: General characters and classification up to order.

Recommended Readings:

- Barnes, R.D. (2006) Invertebrate Zoology. VII Edition, Cengage Learning, India.
- Barnes, R. S. K.; Calow, P.; Olive, P. J. W.; Golding, D. W.; Spicer, J. I. (2002) The Invertebrates: a Synthesis, Blackwell Publishing.
- Pechenik, J. A. (2015) Biology of the Invertebrates. VII Edition, McGraw-Hill Education
- 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.
- Kardong, K.V. (2006) Vertebrates: Comparative Anatomy, Function, Evolution (4th edition), McGraw- Hill.
- Barrington, E.J.W. (2012) Invertebrate Structure and Functions. II Edition, EWP Publishers.
- Ruppert, E.E., Fox, R.S., Barnes, R. D. (2003) Invertebrate Zoology: A Functional Evolutionary Approach. VII Edition, Cengage Learning, India.

Practical (02 Credits):

1. Study of following specimens: *Amoeba*, *Euglena*, *Paramecium*, *Sycon*, *Hyalonema*, *Obelia*, *Physalia*, *Aurelia*, *Taenia solium*, Male and female *Ascaris lumbricoides*, *Aphrodite*, *Nereis*, *Pheretima*, *Hirudinaria*, *Palaemon*, *Limulus*, *Palamnaeus*, *Scolopendra*, *Julus*, *Periplaneta*, *Chiton*, *Dentalium*, *Pila*, *Unio*, *Octopus*, *Pentaceros*, *Echinus*, *Cucumaria*, *Antedon*, *Balanoglossus*, *Herdmania*, *Branchiostoma*, *Petromyzon*, *Pristis*, *Torpedo*, *Labeo*, *Exocoetus*, *Anguilla*, *Ichthyophis*, *Salamandra*, *Bufo*, *Hyla*, *Chelone*, *Chamaeleon*, *Draco*, *Vipera*, *Naja*, *Crocodylus*, Any three common birds from different orders, *Bat*, *Funambulus*, *Loris*.
2. Key for Identification of poisonous and non-poisonous snakes.
3. Study of Digestive, Reproductive and Nervous system of Cockroach.
4. Study of Urinogenital and Nervous system of Rat.
5. Submission of project report on study of animals in nature during a survey of a National Park/ Biodiversity parks/ Zoological Museum.
6. Group discussion or Seminar presentation from any topic from the paper.

