Non-Chordata and Cell Biology

Course Code: BEB 109 **Credit: 04 (L-3, T-1, P-0)**

Contact Hours: 60 **MM: 100**

Course Objectives:

1. To introduce variety of approaches to the study the diversity of non chordates and getting basic idea about the relationships among lower animals and to their environment.
2. To understand the major principles of evolutionary theory, and ranges from the origins of life, through the evolution of specific characters of simple animals.
3. To learn about the origins of advanced characters among non chordates.
4. To explore diversity of chordates ranging from protochordates to vertebrates.
5. To learn about the evolutionary significance of protochordates.
6. To explore basic characters of vertebrates and their adaptations to the different Environmental conditions.

Unit 1: Lower Non-chordates

- **Phylum Protozoa:** General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa
- **Phylum Porifera:**General characters and classification up to classes; Canal System in *Sycon*
- **Phylum Cnidaria:**General characters and classification up to classes; Polymorphism in Hydrozoa
- **Phylum Platyhelminthes:**General characters and classification up to classes; Life history of *Taenia solium*
- **Phylum Nematoda:**General characters and classification up to classes; Life history of *Ascaris lumbricoides*and its parasitic adaptations

Unit 2: Higher Non-chordates

- **Phylum Annelida:**General characters and classification up to classes; Metamerism in Annelida
- **Phylum Arthropoda:**General characters and classification up to classes; Vision in Arthropoda,Metamorphosis in insects
- **Phylum Mollusca:**General characters and classification up to classes; Torsion in gastropods
- **Phylum Echinodermata:**General characters and classification up to classes; Water-vascular system in Asteroidea

Unit 3: Protochordates

- General features and Phylogeny of Hemichordata, Urochordata and Cephalochordata

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Unit 4: Higher chordates or Vertebrates

- **Cyclostomata:** General features and classification of cyclostomes up to classes; Affinities of cyclostomata
- **Pisces:**General features and Classification up to orders;scales in fishes, comparative morphology of Chondrichthyes & Osteoicthyes.
- **Amphibia:** General features and Classification up to orders; Parental care
- **Reptilia:** General features and Classification up to orders; Poisonous and non-poisonous snakes, Biting mechanism in snakes
- **Aves:** General features and Classification up to orders; Flight adaptations in birds
- **Mammals:** Classification up to orders; Origin of mammals

Suggested readings

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1. Miller & Harley: Zoology (6th ed. 2005, Brown)
2. Campbell & Reece: Biology (7th ed. 2005, Pearson)
3. Kotpal: Modern text book of Zoology: Invertebrates (11th ed. 2016 Rastogi)
4. Kotpal: Modern text book of Zoology: Vertebrates (4th ed. 2016 Rastogi)
5. Jordan & Verma: Invertebrate Zoology (Reprint 2014, S. Chand)
6. Jordan & Verma: Chordate Zoology (Reprint 2014, S. Chand)

Course Outcomes:

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

1. Define or describe all kinds of lower invertebrates such as protozoan, sponges and helminthsandhigher invertebrates like annelids, arthropods and marine animals.
2. Understand the significance of rich diversity of invertebrates along with different species and their relationship with different evolutionary characteristics.
3. Analyse the role of various kinds of chordates in development of economy, ecological stabilisation and scientific growth
4. Evaluate the comparative significance of taxonomic groups in ecosystem.
5. Create the basic knowledge of all kinds applications of chordates in daily life of human beings.

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