CORE COURSE 9 – FORMS AND FUNCTIONS IN NON-CHORDATES
CORE COURSE 10 – DEVLOPMENTAL BIOLOGY

CC - 9: FORMS AND FUNCTIONS IN NON-CHORDATES (Credit: 3)

Course Code:

Course Objective: The major objective of the course is to make students understand different structural forms and their functions in non-chordates. The course will help student to identify and describe the major group of non-chordates and their evolutionary relationships based on morphological, anatomical and physiological evidence with their ecological roles. Students will demonstrate their understanding of these concepts through written assignments, quizzes, practical exams, and a final project. By the end of the course, the student will be able to compare and contrast the form and function of differentnon-chordate and chordate taxa, and explain how they are influenced by environmental factors.

Learning Outcome: Student will Learn different structural variations that occur across the non-chordates that help in identification and classification. Student will learn the functional variation in different groups of varied structural forms by comparing and contrasting the anatomical and physiological features of non-chordates. The student will be able to apply the principles of form and function to analyze the structure and function of non-chordates and communicate effectively the learnings of the subject and understand the diversity of non-chordates.

Unit - I
Structural organization of non-chordates. Body plan and symmetry, metamerism, coelom organization and types.
Unit - II
Structure and function of integument and its derivatives, skeletal modification and their role in non-chordates. Locomotion, locomotory organs. Types of locomotion: amoeboid locomotion, ciliary locomotion, flagellar locomotion. Non-jointed and jointed appendages, hydrostatic movements and their mechanism.
Unit - III
Food intake mechanism, feeding patterns, feeding types and methods. Microphagy, Macrophagy, Herbivory, Omnivory, Carnivory, Filter feeding, Ciliary feeding. Intracellular digestion and extracellular digestion. Respiratory pigments and respiration and circulatory systems in non-chordates.

Unit – IV

The primitive and advanced nervous system in non-chordates and chordates. Neurosecretory cells. Diversity in excretory parts, organs and excretory products in non-chordates. Osmoregulation

Unit - V

Reproduction types- Parthenogenesis, Regeneration and sexual reproduction. Significance of larval forms in non-chordates. Metamorphosis and their types in non-chordates

REFERENCES:
1. Invertebrate Zoology: A Functional Evolutionary Approach, Edward 13. Ruppert. Richard S. Fox
2. Invertebrate Zoology. R. S. K. Brous.
3. The Invertebrates. Vol.,. Protozoa through Ctenophore, Hyman. L.H. McGraw Hill Co.. New York.
4. The Invertebrates. Vol.2. Hyman. L.H. McGraw Hill Co.. New York.
5. The Invertebrates. Smaller Coelomate Groups, Vol. 5. Hyman. L.H. McGraw Hill Co., New York.
6. The Invertebrates. Vo1.8. Hyman. LAI. McGraw Hill Co., New York.and London Invertebrate Structure and Function. Barrington. E.J.W. Thomas Nelson and Sons Ltd.. London.
7. Invertebrates. Richard C. Bruce , Gary J. Brume and Nancy J. Haver. A Biology of Higher Invertebrates. Russel-Hunter. WD. McMillan Co. Ltd., London.
8. Student Text Book of Zoology. Vol. 1. II and 111. Sedgwick A. Central Book Depot. Allahabad.
9. Text book of Zoology. Parker, TJ., Haswell. W.A. Macmillan Co., London. Biology of the Invertebrates by Jan A. Pechenik.
10. The Invertebrates: A Synthesis - R. S. K. Barnes Peter P. Calow P. J. W. Olive D.W. Golding J. I. Spicer.

Practical CC -9: FORMS AND FUNCTIONS IN NON-CHORDATES   (Credit: 1)

1. Study of structural organization of non-chordates, types of body plan, symmetry and body segmentation in non-chordates.
2. Study of diverse types of locomotion in non-chordates
3. Study of feeding mechanism types in non-chordates
4. Study of respiratory, circulatory and nervous systems types in non-chordates
5. Studying larval forms available in non-chordates