Zoology

Minor from Discipline **Credit: 04, (FM:100)**

Theory

SEM- I **MN-01** **FM: 60+15=75**

Course objective: This paper incorporates some interesting topics which would help a person to understand trivial specimens of animal world with special attention on cytology and evolution of organisms.

Unit –I **Animal kingdom**

1. An overview of animal kingdom
2. General concept of non chordates up to phylum only
3. Classification of chordates up to class only
4. Prototheria & Metatheria

Unit –II **Animal Cell**

1. Cell (Prokaryotes & Eukaryotes)
2. Different organelles of Cell
3. Mitosis
4. Meiosis

Unit- III **Evolution:**

1. Origin of life
2. Theories of evolution (Lamarckism and Darwinism)
3. Homologus and analogus organs
4. Adaptive modification (Beaks & Claws of birds)
5. Convergent and Divergent evolution

Course outcome: This is an endeavor to give an initial input of Zoology to deal with some complex topics to be taught in higher semesters. Some interesting topics of cell biology and evolution will unfold many questions of animal world to the students within the discipline.

Zoology

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Practical

SEM- I	MN-01	FM: 25, PM: 10

1. Study of Museum Specimens:
Sycon, Aurelia, Ascaris, Tapeworm, Prawn, Grasshopper, *Pila*, Octopus, Starfish, Balanoglossus, *Labeo*, *Scoliodon*, Frog, Lizzard, Cobra, Pigeon, Bat, Squirrel

2. Study of permanent Slides:
Mitosis, Meiosis, Amoeba, Paramecium, Hydra, Obelia, Leishmania

3. Evolution:
Homologus and Analogus organs, Adaptive modifications in beaks and claws of birds

Recommended Books:

Chordates

1. Kotpal, Agarwal & Khetrapal: Modern Textbook of Zoology: Invertebrate (Rastogi publication)
2. R. L.Kotpal: Invertebrate series: Protozoa to Minor phyla (Rastogi publication)
3. R.L.Kotpal: Modern textbook of Zoology: Vertebrate
4. Young, J.Z: Life of Vertebrates (Oxford University Press)
5. Hildebrand: Analysis of vertebrates Structure (Wiley)
6. E.L. Jordan & Dr. P.S. Verma: Chordate Zoology (S. Chand Publication)
7. Alexander, R.M.: The Chordates (Cambridge University Press)
8. Monaith, A. R.: The Chordates (Cambridge University Press)
9. Waterman, A. J.: Chordates: Structure and Function (Mac Millan Co.)
10. Nigam: Biology of Chordates (1997, S Chand)
11. Parker & Haswell: Text Book of Zoology, Vol. II (2005, Macmillan

Cell biology and molecular biology

1. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. VI Edition.John Wiley and Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIIIEdition. Lippincott Williams and Wilkins, Philadelphia.
3. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. V Edition.ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.
4. Molecular Biology of the Gene - Watson, J.D et al (Benzamin / Commings)
5. Lehninger Principles of biochemistry: Cox & Nelson, MacMillan & Freeman, USA
6. Cell Biology- C.B. Pawar (Himalaya publishing house)

Evolution

1. Strik Berger, M.W. Evolution, Jones & Bartett. Publishers, Boston, London
2. An Introduction to Paleontology –A.P.Tyagi (S.Chand & Com.LTD)
3. Hall and Hallgrimsson: Strickberger's Evolution (2008, Jones and Bartlett)
4. Moody: Introduction to Evolution (1978, Kalyani).
5. Rastogi: Organic Evolution (2007, Kedarnath & Ramnath)
6. Evolution- Organic evolution Veer Bala Rastogi, MedTech Science Press
7. Futuyma: Evolutionary Biology (2005, Sinauer)

Practical Manual:

1. A Manual of Practical Zoology Invertebrates: S. Chand, Harnam Singh & Dr. P.S. Hemne
2. Practical Zoology Invertebrate and Vertebrate: S.S. Lal, Rastogi