

ShikshaMandal's
Bajaj College of Science, Wardha
Proposed Syllabus for Four Year Multidisciplinary UG Program with DSC as
Major Zoology

(e.g. Four Year B.Sc. Honors/Research Program)

Program: B.Sc. (Academic Session 2023-24) Syllabus under Autonomy

DSC –I offered by Department of Zoology

Name of the course: **DSC –I Zoology- I (Non Chordate I and cell biology)**

[4hrs/week= 15*4 Th=60Th And 4 hrs/week= 15 weeks* 4 pract = 60 P]

[Credits 4 T+2 P = 6]

Course Description

This course is designed in such a way that the students will gain insights of Non-chordates animals till Phylum Annelida. The students will also learn about Cell Biology with respect to the structure, functions of the organelles as well as cell division.

Course Objectives

To learn the basics about Nonchordate animals upto Annelida and Cell Biology

Course Learning Outcomes

After successful completion of the course, the student is expected to

- CO1: Students will be able to understand and have basic knowledge of Animal Kingdom, Animal Diversity, and its Classification with Major and Minor Phyla.
- CO2: The student should gain insights of the concept of Invertebrate animals starting from Protozoa (Single Cell Animalcules) to multicellular primitive animals like Porifera and Coelenterates to the higher Invertebrates up to Annelida.
- CO3: Students will be able to understand the concept of Phylogenetic Tree of Evolution of Animals from primitive organic particles to higher Invertebrates.
- CO4: Students will gain the basic knowledge of types of cells, cell structure, its organelles and functions.
- CO5: Students will also get insights on origin, structure and function of primitive cell; its evolution and formation of advanced cell, reproduction of cell and abnormal cell division, uncontrolled cell division and cell culture technique.
- CO6: Student passing out in semester I will acquire the knowledge of Non-chordates upto phylum Annelida as well as Cell Biology

UNIT - I

- 1.1 Animal Kingdom - Classification – Flow diagram of classification upto major phylum with few characters and examples.
- 1.2 Protozoa -General Characters.
- 1.3 Paramecium - Structure.
- 1.4 Malaria- Causative organism & its Life cycle.

UNIT - II

- 2.1 Porifera - General characters, External features of Sycon.
- 2.2 Canal system in Sponges - Brief account.
- 2.3 Colenterata- General characters.
- 2.4 Corals & Coral reef formation, Economic importance of corals.

UNIT - III

- 3.1 Helminthes - General characters, Platyhelminthes & Aschelminthes.
- 3.2 Taenia Morphology, Ascaris Morphology
- 3.3 Annelida- General characters.
- 3.4 Leech – Morphology.

UNIT-IV

- 4.1 Cell as basic unit of life. Structure and function of Prokaryotic (E. coli) and Eukaryotic cells (Animal and Plant Cell)
- 4.2 Structure and Functions of plasma membrane. Fluid mosaic model of Plasma Membrane.
- 4.3 Transport across membranes: Active and Passive transport, Facilitated transport, exocytosis, endocytosis, phagocytosis – vesicles and their importance in transport.
- 4.4 Endoplasmic Reticulum: Type, structure and Function.

UNIT V

- 5.1 Structure and Functions of Golgi Complex, Lysosomes and Ribosomes.
- 5.2 Structure of Nucleus: Nuclear envelope, Nuclear pore complex, Nucleoplasm, Nucleolus. Functions of Nucleus.
- 5.3 Chromatin: Eu-chromatin and Hetro-chromatin, nature and differences.
- 5.4 Mitochondria: ultrastructure and function of mitochondrion.

UNIT VI

6. 1 Introduction to Cell Division. Need for Cell divison
- 6.2 Cell cycle (G1, S, G2, M phases),
- 6.3 Mitosis.
- 6.4 Meiosis.

Practical based on Non-chordates and Cell Biology

Part A: Nonchordates

Study of museum specimens(Classification of animals up to orders)

- I. Protozoa(Slides) : -*Paramecium, Euglena, Amoeba, Plasmodium vivax*
- II. Porifera : -*Sycon, Leucosolenia, Hyalonema, Euplectella,*
- III. Coelenterata : -*Obelia, Aurelia, Tubipora, Adamsia*
- IV. Platyhelminthes : -*Planaria, Fasciola, Taenia*
- V. Aschelminthes : -*Ascaris, Wuchereria*
- VI. Annelida : -*Aphrodite, Nereis, Hirudinaria*

II. Study of Permanent Slides

Sponge spicules, T.S. *Sycon*, *Redia* and Cercaria larvae of *Fasciola*, T.S. male and female *Ascaris*, Scolex of *Taenia*

- #### III. Whole mount preparation of or Study of permanent preparation of *Pila* Gill lamella *Obelia* colony, with the help of already available permanent slides/ICTtools/Charts/Photographs.

Part B: Cell Biology

- I. Study of cell: Preparation of temporary mount of human buccal epithelial cells.
- II. Preparation of blood smears to observe the blood cells
- III. Temporary preparation of mitotic cell from onion roots
- IV. Study of Cell organelles (any three) by using microphotographs

Reference Books

Nonchordates - I

1. Barnes –Invertebrate Zoology (Halt-Saunders international) Philadelphia, USA
2. Barradaile L.A. & Potts F.A. – The Invertebrate
3. Nigam –Biology of Nonchordates
4. Kotpal, Agrawal&Khetrapal –Modern Text Book of Zoology - Invertebrates, Rastogi Publication, Meerut
5. Puranik P.G. & Thakur R.S. –Invertebrate Zoology
6. Majupuria T.C. –Invertebrate Zoology
7. Dhami&Dhami –Invertebrate Zoology
8. Parker &Hashwell -Textbook of Zoology Vol. I (Invertebrates) A.Z.T.B.S. Publishers & Distributors, New Delhi
9. Dr. S.S. Lal - Practical Zoology Invertebrates 9th edition, Rastogi Publication Meerut
10. EJW Barrington– Invertebrate Structure and Function ELBS III Edition
11. R.L. Kotpal –Phylum Protozoa to Echinodermata (series), Rastogi and Publication, Meerut

Cell 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.VII Edition. 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. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009).The World of the Cell.VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.
5. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). Molecular Biology of the Cell, V Edition, Garland publishing Inc., New York and London
6. Inside the Cell (2005); US Department of Health Sciences, National Institute of Health, Natinal institute of General Medicine Sciences.
7. Lodish, H., D. Baltimore, A. Berk, L. Zipursky, M. Matsudaira and J. Darnell. (2010).
8. Molecular Cell Biology, Eds. 3, Scientific American & W. H. Freeman. New York.
9. Powar C B.: Cell Biology, Himalaya Publication, Meerut