

ALGAE AND BRYOPHYTES

Course Title: PART A-Algae and Bryophytes	Course Credits: 2
Course Code: BY122	L-T-P per week: 0-0-4
Total Contact Hours: 28 hrs	Duration of ESA: 3 Hours
Formative Assessment Marks:40	Summative Assessment Marks:60

Course Outcomes (COs): At the end of the course the student should be able to understand:

1. Nature of algal thallus, its modes of reproduction
2. Exposure to sea weeds and their cultivation
3. Potential in alternate fuel exploration
4. Advanced thallus organization leading to understanding thallus formation of higher plant forms
5. Application of Embryophytes

Unit 1 4 hrs

- 1.1 Diversity of Algae: Habitat, thallus organization and reproduction.
- 1.2 Life cycles in algae: Haplontic, diplontic, haplobiontic and diplobiontic type

Unit 2 10 hrs

- 2.1 Systematic position, structure and reproduction of the following forms: Anabaena, Scytonema, Volvox, Chara, Sargassum, Batrachospermum.
- 2.2 Economic importance of algae (self-study).

Unit 3 14 hrs

- 3.1 Bryophytes Distribution, general characters, alternation of generation and classification of Bryophytes.
- 3.2 Morphology, anatomy and reproduction of Marchantia, Anthoceros, Funaria (developmental details not required).
- 3.3 Economic importance of Bryophytes (self-study)

Practicals

1. Study of Cyanobacterial forms: a) *Anabaena* b) *Scytonema* c) *Spirulina*.
2. Algae-Study of morphology and reproduction - a) *Volvox* b) *Hydrodictyon* c) *Spirogyra*
3. Algae-Study of morphology and reproduction - a) *Chara* b) *Vaucheria* c) *Sargassum*
d) *Batrachospermum*
4. Bryophytes - Study of morphology and reproduction – a) *Marchantia* b) *Anthoceros*
5. Bryophytes - Study of morphology and reproduction – c) *Funaria*

References

Textbooks

1. Chopra, G.L. A text book of Algae. Rastogi & Co., Meerut, Co., New Delhi, Depot. Allahabad.
2. Johri, Lata and Tyagi, 2012, A Text Book of, Vedam e Books, New Delhi.
3. Sharma, O.P. 1990. Text Book of Pteridophyta. McMillan India Ltd. New Delhi.
4. Sharma, O.P. 1992. Text Book of Thallophytes. McGraw Hill Publishing Co. New Delhi.
5. Sharma, O.P., 2017, Algae Singh-Pande-Jain 2004-05. A Text Book of Botany. Rastogi Publication, Meerut.

References:

1. Sambamurty, A.V.S.S.. A Text Book of Algae. I.K. International Private Ltd., New Delhi.
2. Agashe, S.N. 1995. Paleobotany. Plants of the past, their evolution, paleoenvironment and Allied plants. Hutchinson & Co., Ltd., London.
3. Anderson R.A. 2005, Algal cultural Techniques, Elsevier, London.
4. Publication, Application in exploration of fossil fuels. Oxford & IBH., New Delhi.
5. Eams, A.J., (1974) Morphology of vascular plants - Lower groups. Tata McGraw-Hill Publishing Co. New Delhi, Freeman & Co., New York.
6. Fritze, R.E. 1977. Structure and reproduction of Algae. Cambridge University Press.
7. Goffinet B and Shaw A.J. 2009, Bryophyte Biology, 2nd ed. Cambridge University Press, Cambridge.
8. Srivastava, H N, 2003. Algae. Pradeep Publication, Jalandhar, India.
9. Kakkar, R.K. and B.R.Kakkar (1995) The Gymnosperms (Fossils and Living) Central Publishing House, Allahabad.
16. Smith, G.M. 1971. Cryptogamic Botany. Vol. II. Bryophytes & Pteridophytes. Tata McGraw Hill Publishing, New Delhi.
17. Smith, G.M. 1971. Cryptogamic Botny. Vol.I Algae & Fungi. Tata McGraw Hill Publishing. New Delhi.
18. Sporne, K.R. 1965. The Morphology of Gymnosperms. Hutchinson & Co., Ltd., London.
19. Stewart, W.M. 1983. Paleobotany and the Evolution of Plants, Cambridge University Cambridge.
20. Sundarajan, S. 1997. College Botany Vol. I. S Chand & Co. Ltd., New Delhi.
21. Vanderpoorten, A. and Goffinet, B. 2009, Introduction to Bryophytes, Cambridge University Press, Cambridge.
22. Vashista, B.R. 1978. Bryophytes. S Chand & Co. Ltd., New Delhi

PART B- ZOOLOGY SEMESTER II

DIVERSITY OF NON-CHORDATES

Semester II

Course Title: PART B-Diversity of Non Chordates	Course Credits: 2
Course Code: BY122	L-T-P per week: 0-0-4
Total Contact Hours: 28 hrs	Duration of ESA: 3 Hours
Formative Assessment Marks:40	Summative Assessment Marks:60

Course Outcomes (COs): At the end of the course the student should be able to understand:

1. The classification of organisms.
2. The phylogeny and evolution of organs and organ systems.
3. The basic principle of life, how complex organisms have evolved from simpler ones
4. Indirect methods of development through larval stages.
5. Modification of body systems as a mode of adaptation to different habitats.
6. A thorough understanding of useful non chordates.
7. An understanding of the disease causing non chordates and the infections associated with them.
8. Understanding of variety of life forms.

UNIT-I: ANNELIDA

6hrs

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| 1.1 | Distinguishing features and classification up to classes, with suitable examples. | 1hr |
| 1.2 | Heteronereis, Trochophore larva and its phylogenetic significance | 2hrs |
| 1.3 | Earthworm morphology and digestive system | 2hrs |
| 1.4 | Vermiculture- an account of how to culture earthworms (Self study) | 1hr |

UNIT-II: ARTHROPODA

7hrs

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| 2.1 | Distinguishing features and classification up to classes, with suitable examples. | 1hr |
| 2.2 | Brief account of Trilobites. Unique features and systematic position of Peripatus. | 3hrs |
| 2.3 | Brief account of the externals and life history of <i>Bombyx mori</i> (Self study) | 1hr |

8.4 Larval forms in crustaceans-Nauplius, Metanauplius, Protozoa, Zoea, Mysis 2 hrs

UNIT-III: MOLLUSCA

7hrs

3.1 Distinguishing features and classification up to classes, with suitable examples. Brief account of Ammonites. 1hr

3.2 Freshwater mussel- externals, C.S. of shell (**self study**) 1 hr
respiratory, digestive system and circulatory systems. 3hrs

3.3 Structure and function of foot in – Neopilina, Chaetoderma, Chiton, Mytilus, Pila, Aplysia, Dentalium and Octopus 2hrs

UNIT-IV: ECHINODERMATA

5hrs

4.1 Distinguishing features and classification up to classes, with suitable examples. 1hr

4.2 Starfish - Externals and water vascular system. 2hrs

4.3 Phylogenetic significance of Echinoderm larva with respect to Bipinnaria, Ophiopluteus, Echinopluteus, and Auricularia Larvae. 2hrs

UNIT-V: MINOR PHYLA

3hrs

5.1 List of minor phyla with examples, Salient features and affinities of Rotifera with *Brachionus* as an example. 3hrs

REFERENCE BOOKS

1. TEXT OF ZOOLOGY. Vol 1. By Parker and Haswell. CBS Publishers and distributors.
2. INVERTEBRATES STRUCTURE AND FUNCTION. By Barrington. ELBS
3. INVERTEBRATE ZOOLOGY. By Meclisten. Oxford Publishing house.
4. INVERTEBRATES. Vol.1. By Kotpal. Rastogi publications.
5. INVERTEBRATE ZOOLOGY. By Jordan and Verma. S Chand & Co.,
6. INVERTEBRATE ZOOLOGY. By Dhami & Dhami.
7. INVERTEBRATES. By Majpuria.
8. A MANUAL OF ZOOLOGY. Vol 1. By Ekambarnath Iyer and Anantha Krishnan

9. INVERTEBRATE ZOOLOGY Vol I - Vol VI. By L H Hyman McGraw Hill Book Company
10. INVERTEBRATE ZOOLOGY. By Barnes, Hault Saunders, 4th Edition.
11. ECONOMIC ZOOLOGY. By G.S. Hubhla & V.B. Upadhyoya
12. BIOLOGY OF ANIMALS. Vol 1. By Adhikari, Sinha and Ganguli. New central book agency, Calcutta.
13. BIOLOGY OF NON CHORDATES. By Nigam H.C. Naginchand S L and Co. Jallander.
14. PARASITIC PROTOZOA. Baker JR,
15. A GENERAL ZOOLOGY OF THE INVERTEBRATES Carter GS.
16. A STUDENT TEXTBOOK OF ZOOLOGY. Sedgewick.
17. THE INVERTEBRATES, PLATYHELMINTHES AND RHYNCOCOELA. Hyman L H
18. BIOLOGY OF INVERTEBRATES. Hickman CP,
19. INTEGRATED PRINCIPLES OF ZOOLOGY. Hickman CP,
20. ZOOLOGY, Winchester and Lovell, Newyork

Zoology Core Lab Course Content

Semester II

Course Title: PART B-Diversity of Non Chordates	Course Credits: 2
Course Code:	L-T-P per week: 0-0-4
Total Contact Hours: 28 hrs	Duration of ESA: 3 Hours
Formative Assessment Marks: 15	Summative Assessment Marks: 35

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Describe diversity of life, general rules of animal taxonomy, symmetry, germ layers, coelomic cavities, metamerism and cephalization.
2. To identify and understand the larval forms of Non Chordates
3. To outline the life cycle of parasites and their impacts on health.
4. To describe how the life cycle of Bombyx mori has been exploited for sericulture.
5. To identify the appendages of Prawn and a thorough understanding of its bodyplan

DIVERSITY OF NON-CHORDATES-PART B

Total number of Practicals: **5**
units/28 hrs

ANNELIDA

Nereis, Parapodium, Heteronereis, Aphrodite, Arenicola, Sabella, Chaetopeterus, Trochophore larva, Earthworm - T.S. passing through the typhlosolar region. Mount setae 1 unit

ARTHROPODA

Peripatus, Centipede, Millipede, Limulus (king crab), Nauplius larva, Mysis larva 1 unit

MOLLUSCA

Nautilus, Pearl Oyster, Octopus, Sepia, Dentalium, Patella, Cypraea, Haliotes, Cuttle bone, Chiton 1 unit

ECHINODERMATA

Star fish, Brittle star, Sea lily, Sea cucumber, Sea urchin, Cake urchin, Pedicellaria, Bipinnaria larva. 1 unit

DISSECTION:

Mounting of the appendages and nervous system (*Panaeus*) 1 unit