

**JYOTI NIVAS COLLEGE AUTONOMOUS
SYLLABUS FOR 2018 BATCH AND THEREAFTER**

Programme: B.Sc.

Semester: II

ZOOLOGY PAPER II

NON CHORDATA: ARTHROPODA TO ECHINODERMATA

CHORDATA: PROTOCHORDATA AND AGNATHA

Course Code: 18IIZO2

No. of Hours: 60

COURSE OBJECTIVES:

- To understand the diversity of higher invertebrates
- To create awareness of economic significance of the invertebrates
- To understand the primitive chordates and trace the evolution to chordates

LEARNING OUTCOMES:

- Students acquired knowledge on identification and classification of higher invertebrates
- Provide theoretical and practical knowledge on skill and entrepreneurial opportunities on apiculture, prawn culture and chonology
- Knowledge on integrated pest management
- Obtain knowledge on evolutionary aspects of chordates

UNIT I: ARTHROPODA

16 HRS

1.1 General characters of the phylum and classification up to classes with examples **2 HRS**

1.2 Peripatus: Unique features and systematic position **1 HR**

1.3 Prawn: Penaeus species – Externals & appendages (In detail), Reproductive system and Life Cycle **4 HRS**

1.4 Integument and its significance **1 HR**

1.5 Respiratory organs: Gills, book gills, trachea, book lungs **2 HRS**

1.6 Sense organs: Structure of simple and compound eyes and tactile organs **2 HRS**

1.7 A brief account of metamorphic patterns in insects with examples, Neuro-endocrine regulation of metamorphosis in insects **2 HRS**

1.8 Social organization in Termites and Termitaria **2 HRS**

UNIT II: MOLLUSCA

9 HRS

2.1 General characters of the phylum and classification upto classes with examples **2 HRS**

2.2 Unio species – Externals, Structure of the shell in section, Digestive, Respiratory, Circulatory, Reproductive systems and life cycle **5 HRS**

2.3 Modification of foot: Chiton, Dentalium, Mytilus, Aplysia and Sepia	2 HR
UNIT III: ECHINODERMATA AND MINOR PHyla	10 HRS
3.1 General characters of the phylum and classification up to classes with suitable examples	2 HRS
3.2 Sea star: Externals, Digestive system, Water vascular system , Reproduction and life cycle	5 HRS
3.3 Structure and significance of the following larvae: Bipinnaria, Ophiopluteus, Echinopluteus and Auricularia	1 HR
Minor Phyla	
3.4 General characters of Ctenophora, Rotifera and Chaetognatha with suitable examples	2 HRS
UNIT IV: CHORDATA AND HEMICHORDATA	7 HRS
4.1 Origin of Chordates	1 HR
4.2 Basic chordate characters and outline classification of Chordates	1 HR
4.3 Balanoglossus– Externals, Modification of the coelom in the three regions and Tornaria Larva	3 HRS
4.4 Affinities and systematic position of Hemichordates	2 HRS
UNIT V : CEPHALOCHORDATA AND UROCHORDATA	6 HRS
5.1 Cephalochordata: Amphioxus – Externals, Mode of feeding , Circulatory system and Excretory system	4 HRS
5.2 Urochordata: Ascidian – Externals, Ascidian Tadpole and retrogressive metamorphosis	2 HRS
UNIT VI: AGNATHA	4 HRS
6.1 General characters and outline classification up to orders	1 HR
6.2 Petromyzon-Externals and Reproduction with special emphasis on the Ammocoete larva and its significance	3 HRS
UNIT VII: ECONOMIC ZOOLOGY	8 HRS
7.1 Economic importance of	
7.1.a. Arthropoda: Sericulture and silk worm rearing	2 HRS
7.1.b. Apiculture-types of bees and beekeeping	2 HRS
7.2 Mollusca: Mytilus and pearl culture, chalk and lime industries	2 HRS
7.3. Integrated Pest Management	2 HRS

Practical – II

NON CHORDATA: ARTHROPODA TO ECHINODERMATA

CHORDATA: PROTOCHORDATA AND AGNATHA

DURATION: 3 HRS/UNIT

NO. OF UNITS: 15

1. NON CHORDATA

a.ARTHROPODA 3 UNITS

Specimens - Peripatus, Centipede, Millipede, Limulus, Praying mantis

Work shop on Apiculture and submission of the report

Arthropod pests: collection and submission of 5 common pests

b.MOLLUSCA 2 UNITS

Specimens- Chiton, Aplysia, Sepia and Oyster

Shell Pattern in Dentalium, Murex, Nautilus and Sepia

c.ECHINODERMATA 1 UNIT

Specimens -Sea star, Brittle star, Sea urchin, Sea cucumber and Sea lily Ophiopluteus larva.

II.CHORDATA

a.PROTOCHORDATA 2 UNITS

Specimens - Balanoglossus, Amphioxus & Ascidia,

Slides of:-T. S. of Balanoglossus through proboscis

T.S of Amphioxus through pharynx and intestine.

b.AGNATHA 1 UNIT

Specimens –Petromyzon, Myxine and Ammocoete larva

III.STUDY OF DISSECTED ANIMAL SYSTEMS 3 UNITS

a. Cockroach 1. Mouth parts

 2. Nervous System

b. Fresh water mussel 1. Digestive system

 2. Nervous system

IV. Prawn- Mounting of appendages 1 UNIT

Practical tests/repetition 2 UNITS

Note: 13 Practical + 2 units for practical tests/repetition

REFERENCES:

INVERTEBRATA:

1. ADHIKARI, SINHA AND GANGULI., 1991. BIOLOGY OF ANIMALS VOL. 1. New Central Book Agency, Calcutta.
2. BARNES R.D., 1980. INVERTEBRATE ZOOLOGY, Hault Saunders, International edition, Philadelphia, 4th edition.
3. BARRINGTON E.J.W., 1969 INVERTEBRATE STRUCTURE AND FUNCTION, Thomas Nelson & Sons Ltd, Barrington, 1st Edition.
4. CHAPMAN R.F. 1971. THE INSECTS: STRUCTURE AND FUNCTION, English Universities press Ltd, London.
5. DHAMI P.K. & DHAMI J.K. 1994. INVERTEBRATE ZOOLOGY, R Chand & Co, New Delhi.
6. EKAMBERNATH IYER M AND ANANTHAKRISHNAN T.N, 1986. OUTLINES OF ZOOLOGY: INVERTEBRATE: Vol. 1, S Vishwanathan printers and publishers pvt ltd.
7. HEGNER R.W AND STILES K.A., 1959. COLLEGE ZOOLOGY, The Macmillan Company, New York, 7th edition.
8. HYMAN L.H, 1967. THE INVERTEBRATES, Vol. VI. Mollusca I McGraw and Hill Book company
9. HYMAN L.H, 1967. THE INVERTEBRATES, Vol. IV. Echinodermata McGraw and Hill Book company
10. JORDAN E.L. AND P.S VERMA. 1963. (Reprint 2002) INVERTEBRATE ZOOLOGY, S. Chand & company, New Delhi
11. KOTPAL R.L. 1998. INVERTEBRATES. Rastogi publications, Meerut, 7th edition.
12. NIGAM.H.C. 1991. BIOLOGY OF NON CHORDATES, NAGINCHAND S.L. and CO., Jallandar,
13. SHUKLA G.S AND UPADHYAY V.B, Reprint 2002. ECONOMIC ZOOLOGY, Rastogi Publications, Meerut, 4th Ed.
14. SOULSBY. HELMINTHES, ARTHROPODS AND PROTOZOAN OF DOMESTICATED ANIMALS S, E.C.J. publisher, 7th Ed
15. VIMALA C.M, 2004 INTRODUCTORY ZOOLOGY Vol. I, Interline publishing, Bangalore
16. VIMALA C.M, 2005 INTRODUCTORY ZOOLOGY Vol. II, Interline publishing, Bangalore.

CHORDATA

1. BANARJEE V. 1993. INTERMEDIATE ZOOLOGY, Bharathi Bhavan publishers, Patna

2. BHAMRAHN.S. and KAVITHA JUNEJA.1991. ZOOLOGY PHYLUM SERIES Anmol publications, Delhi
3. DHAMI P.K. & DHAMI J.K. 1988. CHORDATE ZOOLOGY, R Chand & Co, New Delhi, 5th edition.
4. DHAMI P.S. 1988. CONCEPTS OF GENERAL ZOOLOGY, Pradeep Publications
5. EKAMBARNATH IYER M AND ANANTHAKRISHNAN T.N, 1981. A MANUAL OF ZOOLOGY: CHORDATA (Part II). S Vishwanathan printers and publishers pvt ltd., 3rd edition
6. GROVE & NEWELL. 1990. ANIMAL BIOLOGY, Universal Book stall, New Delhi, 9th edition.
7. HEGNER R.WAND STILES K.A., 1959.COLLEGE ZOOLOGY, The Macmillan Company, New York, 7th edition.
- 8.JORDAN E.L. AND P.S VERMA.1965. (Reprint 2001) CHORDATE ZOOLOGY, S. Chand &company, New Delhi
9. KOTPAL R L .1993.ZOOLOGY PHYLUM SERIES, Rastogi Publications, Meerut
10. KOTPAL R.L. 1991. VERTEBRATES,Rastogi Publications, Meerut
- .11. MARSHALL A.J,PARKER J & HASWELL W.A. 1988. TEXT BOOK OF ZOOLOGY VERTEBRATES, C.B.S Publishers & Distributors
12. VIMALA C.M, 2005 INTRODUCTORY ZOOLOGY Vol. III, Interline publishing,Bangalore.
13. YOUNG J, 1981. THE LIFE OF VERTEBRATES, Oxford University Press, Oxford, 2ndedition