

| SEMESTER I | | | |
|--------------------------------|---------------------|---------------------|--------------------|
| Allied I Animal Biology | | | |
| Code: 18UZOAI1 | Hrs/Week : 4 | Hrs/Sem : 60 | Credits : 3 |

Vision : To make the students to realize about the diverse forms of invertebrates and vertebrates

Mission : Students will develop broad knowledge of the extreme diversity in animal forms, functions, adaptations and natural history.

Course Outcome:

| CO.No | Upon completion of this course, students will be able to | PSO addressed | CL |
|--------------|--|----------------------|-----------|
| CO-1 | acquire basic knowledge of animal diversity and its organisation | 1 | Un |
| CO-2 | compare common and distinctive features of invertebrate phyla | 1 | Un |
| CO-3 | understand the parasitic adaptations and management of nematodes | 1 | Un |
| CO-4 | ability to control the insect pests | 1 | Ap |
| CO-5 | characterize the major classes of subphylum vertebrata | 1 | Re |
| CO-6 | assess the interaction of organisms with environment and their adaptive mechanism | 1, 11 | Re |
| CO-7 | distinguish the unique features and evolutionary relationship between each chordate group | 1 | Cr |
| CO-8 | apply the knowledge of biological diversity to our daily life and conservation of bioresources | 1, 11 | Ap |

| SEMESTER I | | | |
|-------------------------|--------------|--------------|-------------|
| Allied I Animal Biology | | | |
| Code: 18UZO A11 | Hrs/Week : 4 | Hrs/Sem : 60 | Credits : 3 |

Unit I Invertebrata

General characters and outline classification of invertebrates upto classes

General characters of phylum Protozoa, Porifera, Coelenterata, Helminthes

Annelida, Arthropoda, Mollusca and Echinodermata

Type study : *Paramecium* – external characters, locomotion, osmoregulation nutrition,

Reproduction- binary fission and conjugation.

Unit II Nematode Parasites and Insect Pests

Nematode parasites of man – external morphology, life cycle, pathogeny, parasitic adaptations and control measures of the following:

Ascaris lumbricoides round worm)

Wuchereria bancrofti (filarial worm)

Insect Pests

Pests of paddy – *Leptocorisa varicornis* and *Triporeya incertulas*

Pests of coconut – *Oryctes rhinoceros* and *Rhynchophoru*

Unit III General Topics in Invertebrata

Canal system in sponges- Polymorphism in Coelenterata-Social life in insects -

Honey bee- Pearl culture - Water vascular system in Echinodermata

Unit IV Chordata

General characters and outline classification of Chordata

Salient features of classes Pisces, Amphibia, Reptilia, Aves and Mammalia.

Economic importance of food fishes

Fresh water fishes- *Catla catla* (Catla), *Labeo rohita* (Rohu) and *Cirrhinus*

mrigala (Mrigala) Marine water fishes – *Cybiu maculatum* (Seer fish), *Trichiurus*

(Ribbon fish) and *Anguilla anguilla* (Eel)

Unit V General Topics in Chordata

Identification of poisonous snakes- poison apparatus – biting mechanism – first aid for snake bite-Migration in fishes- Parental care in Amphibia- flight adaptations -aquatic mammals.

Text Books

1. Arumugam N. 2017 *Text Book of Animal Diversity Invertebrata and Chordata*. Saras Publication, Nagercoil.
2. Jayasurya, N.Arumugam, A. Thangamani, S.Prasanna Kumar and Ramprabhu,2013. *Economic Zoology* Saras Publication, Nagercoil.

Books for Reference

1. Ekambaranatha Iyyer M. A Viswanathan S. 1993, *Manual of Zoology Vol I Vol II* Viswanathan Printers and Publishers, Chennai.
2. Nair N. C, Leelavathy S, Soundara Pandian N, Murugan T. and Arumugam N. 2004, *A Text Book of Invertebrates. First edition* Saras Publication, Nagercoil.
3. Arumugam N. 2010 *Text Book of Chordates* . Revised edition Saras Publication, Nagercoil.
4. Jordon E. C.and.Verma P.S. 2009 *Invertebrate Zoology. Revised edition*. S. Chand and Company Ltd. New Delhi.
5. Shukla G.S.and Upadhyay V.B. 1985 *Economic Zoology*, First edition. Rastogi Publication, Meerut.

PRACTICALS

Hrs / Week – 2

Cockroach : Digestive system and Nervous System

Mounting : Honey bee - Mouth parts

Earth worm - Body setae

Shark -Placoid scale

Slides/Models/Charts:

Invertebrata: *Paramecium*, *Leucosolenia*, *Obelia* colony, *Ascaris* (male and female) insect pests (*Oryctes rhinoceros*, *Leptocorisa varicornis*), Pearl oyster, Octopus and Star fish

Chordata: *Anguilla* (Eel), *Salamander*, *Naja naja*, poison apparatus,

Pigeon, aquatic mammals (Whale and Dolphin)

Books for Reference

1. S. Leelavathy, N.Soundara Pandian and T. Murugan. 2013. *Practical Zoology Vol.I Invertebrata*. Saras Publication, Nagercoil.
2. P.S.Verma and S. Chand. *A Manual of Practical Zoology Chordates*. S. Chand and Company Ltd, Ramnagar, New Delhi.

| SEMESTER II | | | |
|--|---------------|---------------|-------------|
| Allied II Genetics, Developmental Biology and Physiology | | | |
| Code: 18UZO A21 | Hrs/ Week : 4 | Hrs/ Sem : 60 | Credits : 3 |

Vision

To highlight the importance of genetics, developmental biology and physiology to the society

Mission

Students will learn the developmental stages, structure and functions of various organ systems of human.

Course Outcome :

| CO. No | Upon completion of this course, students will be able to | PSO addressed | CL |
|--------|--|---------------|----|
| CO - 1 | compare and contrast the Mendelian inheritance and its modifications | 4 | An |
| CO - 2 | highlight the importance of genetics and welfare of human society. | 11 | Ev |
| CO – 3 | acquire competence skills in developmental process | 1 | Un |
| CO – 4 | learn the technical skills in developmental biology | 3 | Re |
| CO – 5 | understand the basic principles of digestion | 2 | Un |
| CO – 6 | create knowledge about the nervous coordination | 7 | Cr |
| CO – 7 | analyze the functions of urinary tract of human | 9 | Ap |
| CO - 8 | comprehend the structure and functions of human reproductive system | 9 | Ap |

| SEMESTER II | | | |
|----------------|--|---------------|-------------|
| Allied II | Genetics, Developmental Biology and Physiology | | |
| Code: 18UZOA21 | Hrs/ Week : 4 | Hrs/ Sem : 60 | Credits : 3 |

Unit I Genetics

Mendelian laws – monohybrid and dihybrid cross – back cross – test cross – ABO blood group – Rh factor in man – Erythroblastosis foetalis – sex determination in man – sex linked inheritance of haemophilia and colour blindness – Down's and Klinefelter's syndrome .

Unit II Developmental Biology

Frog - structure of sperm and ovum – fertilization – cleavage, gastrulation – fate map. Placenta in mammals – types (diffuse, cotyledonary, intermediate, zonary, discoidal and metadiscoidal) and functions. Test tube babies – twins- amniocentesis.

Unit III Physiology - Digestion

Nutrition : Food constituents – carbohydrates, proteins and fats.
 Digestion : Role of enzymes in the digestion of carbohydrates, proteins and fats
 Absorption : Absorption of digested food

Unit IV Respiration and Nervous co - ordination

Respiration : Haemoglobin – transport and exchange of oxygen and carbondioxide. Nervous co – ordination : Structure and types of neurons – conduction of nerve impulse through neuron and synapse.

Unit V Excretion and Reproduction

Excretion : Structure of nephron - urine formation – dialysis.
 Reproduction : Srtucture of human testis and ovary, Graafian follicle, menstrual cycle and its hormonal control.

Text Books :

1. Arumugam .N., 2007. *Developmental Zoology, Ecology, Animal Physiology and Evolution* . Saras Publication – Nagercoil
2. Verma.P.S. and U.K. Agarwal,2000 *Chordate Embryology (10th Edition)* S.Chand & Company Ltd, New Delhi.

Books for Reference

1. Verma, P.S. and V.K.Agarwal 2013. *Cell Biology, Genetics, Molecular Biology, Evolution & Ecology*. S.Chand & Company.
2. Arumugam N(2009) *Developmental Zoology* - Saras Publication
3. Meyyan R.P 2007 . *Genetics*. Saras Publication, Nagercoil
4. Verma P.S., Tyagi B.S. and V.K. Agarwal. 2002. *Animal Physiology, 6th Edition*. S.Chand & Company Ltd, New Delhi.

PRACTICALS

Hrs/ Week : 2

1. Verification of Mendel's monohybrid cross using beads
2. ABO blood grouping - Demonstration
3. Qualitative tests for glucose, protein and lipid
4. Effect of temperature on the opercular movement of fish ; Calculation of Q_{10}
5. Examination of excretory products (ammonia, urea and uric acid crystals)
6. Museum specimens : Slides / Charts / Models
Sex linked inheritance of colour blindness, haemophilia, Down syndrome. Frog - sperm and egg, diffuse placenta (pig), cotyledonary placenta (sheep). Villus, nephron, neuron, human sperm and human egg

Books for Reference

Jeyasurya, Dulsy Fatima, Kumaresan and Selvaraj 2013. *Practical Zoology*
Volume -3, Saras Publication, Nagercoil

| SEMESTER I | | | |
|----------------|----------------|----------------|------------|
| Core I | | Invertebrata I | |
| Code :18UZOC11 | Hrs / Week : 4 | Hrs/ Sem : 60 | Credits: 4 |

Vision: To impart knowledge on invertebrate animals- up to phylum Platyhelminthes

Mission: To elaborate the organization, functional morphology, anatomy and taxonomic position of representative invertebrates.

Course Outcomes:

| CO.No | Upon completion of this course, students will be able to | PSO addressed | CL |
|--------|--|---------------|----|
| CO - 1 | understand the basic concepts of animal taxonomy | 1 | Un |
| CO - 2 | know the distinctive features of taxonomic classes within the phyla covered | 1 | Re |
| CO -3 | recognize the common members of each phylum and of selected classes and orders | 1 | Re |
| CO - 4 | analyze the important concepts in invertebrate body structure and organization, including body symmetry, body cavity, gut formation, Segmentation | 2 | Un |
| CO - 5 | examine the important biological processes in invertebrates, including locomotion, body support, reproduction, development, feeding, digestion, excretion, osmoregulation, circulation, respiration, sensory perception, behavior etc. | 2 | Un |
| CO - 6 | impart information on the ecological and economic importance of invertebrates. | 1 | Un |
| CO - 7 | aware of the importance and diversity of invertebrates. | 1 | Un |
| CO - 8 | develop basic laboratory skills including microscopy, dissection and careful observation. | 8 | Cr |

| SEMESTER I | | | |
|----------------|----------------|----------------|------------|
| Core I | | Invertebrata I | |
| Code :18UZOC11 | Hrs / Week : 4 | Hrs/ Sem : 60 | Credits: 4 |

Unit I General Principles of Animal Taxonomy

Taxonomy - Definition, systems of classification. Nomenclature – Binomial nomenclature - rules of nomenclature. Taxonomic hierarchy and categories. Salient features of invertebrates.

Unit II Phylum Protozoa

General characters and classification up to classes with examples. Type study – *Paramecium* - morphology, nutrition, osmoregulation, excretion, reproduction- binary fission, conjugation. General topic: Life cycle and pathogenicity of *Plasmodium*

Unit III Phylum Porifera

General characters and classification up to classes with examples. Type study - *Leucosolenia*- structural organization, reproduction- asexual and sexual development. General topics: Canal system and spicules in sponges.

Unit IV Phylum Coelenterata

General characters and classification up to classes with examples. Type study – *Obelia* – structure and life history. General topics: Polymorphism in coelenterates, corals and coral reefs.

Unit V Phylum Platyhelminthes

General characters and classification up to classes with examples. Type study – *Taenia solium* – structure, reproductive system life history and pathogenicity. General Topics: Parasitic adaptations in Platyhelminthes.

Text Books

1. Nair, N.C., Leelavathi, S. and N.A. Soundara Pandian. 2006. *Text book of Invertebrates*. Saras Publication, Nagercoil.
2. Murugan, T. and N. Arumugam. 2006. Saras Publication, Nagercoil.

Books for Reference

1. Jordan, E.L. and P.S. Verma. 2007. *Invertebrate Zoology*. S.Chand, New Delhi.
2. Mary, S. Gardiner 1972 .*The Biology of Invertebrates*. Mc Graw-Hill Book Company.
3. Robert, D Barnes 1982. *Invertebrate Zoology*. Holt Saunders, International Editions
4. Kotpal, R. and L. Rastogi. 1972. *Zoology Phylum Series*. Subhash Bazar, Meerut.
5. Ekambaranatha Iyer, M. and T.N. Ananthakrishnan. 1977. *A Manual of Zoology* – Vol.I. S.Viswanathan, Pvt Ltd.
6. Arumugam. N. 2017. *Animal Diversity Invertebrata and Chordata*. Saras Publication, Nagercoil.

Websites for Reference:

<http://www.enchantedlearning.com/subjects/invertebrates/index.shtml>

<http://animalkingdom.net/category/invertebrates/>

<http://animaldiversity.org/>

| SEMESTER I | | | |
|---------------|----------------|-----------------|------------|
| Core II | | Invertebrata II | |
| Code:18UZOC12 | Hrs / Week : 4 | Hrs/ Sem : 60 | Credits: 4 |

Vision: To impart knowledge on invertebrate animals up to phylum Echinodermata

Mission: To elaborate the organization, functional morphology, anatomy and taxonomic position of representative invertebrates.

Course outcome:

| CO.No | Upon completion of this course, students will be able to | PSO addressed | CL |
|--------|--|---------------|--------|
| CO – 1 | identify common members of each phylum and of selected classes and orders | 1 | Un |
| CO- 2 | understand the distinctive features of taxonomic classes within the phyla covered. | 1 | Un |
| CO -3 | acquire knowledge on the importance, and diversity of the invertebrates | 1 | Un |
| CO – 4 | analyze the important concepts in invertebrate body structure and organization, including body symmetry, cephalization, body cavity, gut formation, segmentation | 2 | Un |
| CO – 5 | learn important biological processes in invertebrates, including locomotion, body support, reproduction, development, feeding, digestion, excretion, osmoregulation, circulation, respiration, sensory perception, behavior.etc. | 2 | Re, Kn |
| CO – 6 | aware of the ecological and economic importance of invertebrates | 1 | Un |
| CO – 7 | develop basic laboratory skills including microscopy, dissection and careful observation. | 8 | Cr |
| CO – 8 | use knowledge in invertebrates as basic course for further subjects on higher level study. | 1 | Ap |

| SEMESTER I | | | |
|---------------|----------------|-----------------|------------|
| Core II | | Invertebrata II | |
| Code:18UZOC12 | Hrs / Week : 4 | Hrs/ Sem : 60 | Credits: 4 |

Unit I Phylum Aschelminthes

General characters and classification up to classes with examples. Type study – *Ascaris* – structure, reproduction, life cycle and pathogenecity. General topic: Life history, pathogenecity and control measures of *Wuchereria*

Unit II Phylum Annelida

General characters and classification up to classes with examples. Type study – Earthworm- structure, locomotion, digestive system, circulatory system, excretory system, nervous system and reproductive system. General topics: Biological significance of earthworm – bait, food, agriculture, medicine, laboratory and research purpose.

Unit III Phylum Arthropoda

General characters and classification up to classes with examples. Type study – *Penaeus*- structure, circulatory system, digestive system, excretory system, nervous system, sense organs, reproductive system and life history. General topics: Beneficial (honey bee, silk moth) and harmful insects (*Leptocorisa*, *Oryctus rhinoceros*)

Unit IV Phylum Mollusca

General characters and classification up to classes with examples. Type study – *Pila* – structure, digestive system, respiratory system, circulatory system, excretory system, nervous system, sense organs and reproductive system. General topic: Cephalopods are advanced molluscs.

Unit V Phylum Echinodermata

General characters and classification up to classes with examples. Type study – Star fish– structure and water vascular system. General topic: Larval forms of Echinoderms

Text Books

1. Nair, N.C., Leelavathi, S. and N.A. Soundara Pandian. 2006. *Text book of Invertebrates*, Saras Publication, Nagercoil.
2. Murugan.T. and N. Arumugam. 2006. *Invertebrates*, Saras Publication, Nagercoil.

Books for Reference

1. Jordan, E.L. and P.S. Verma. 2007. *Invertebrate Zoology*. S.Chand, New Delhi.
2. Mary. S. Gardiner. 1972. *The Biology of Invertebrates*. Mc Graw-Hill Book Company.
3. Robert. D. Barnes. 1982. *Invertebrate Zoology*. Holt Saunders, International Editions.
4. Kotpal, R. and L. Rastogi. 1972. *Zoology Phylum Series*, Subhash Bazar, Meerut.
5. Ekambaranatha Iyer, M. and T.N. Ananthakrishnan. 1977. *A Manual of Zoology – Vol.I*. S.Viswanathan, Pvt Ltd.
6. Arumugam. N. 2017. *Animal Diversity Invertebrata and Chordata*. Saras Publication, Nagercoil

Websites for Reference

<http://www.enchantedlearning.com/subjects/invertebrates/index.shtml>

<http://animalkingdom.net/category/invertebrates/>

<http://animaldiversity.org/>

PRACTICALS

Hrs / Week – 2

Credit : 1

I. Dissections

Cockroach : Digestive and Nervous system

II Mountings

Cockroach : Mouth parts, Trachea

Earthworm: Body setae and Pineal setae

Prawn : Appendages

III Spotters

- a) Studies of the animals with special reference to systematic position up to orders habit, habitat, characteristic features and economic importance of -Paramecium, Euglena, Sycon, Obelia, Physalia, Fungia, *Taenia solium*, *Fasciola hepatica*, Ascaris (male& female), Earthworm, Nereis, Prawn, Peripatus, Pila, Sepia, Asterias, Sea cucumber
- b) Observation of the following permanent slides
Tapeworm scolex, Larval forms of *Fasciola hepatica* (redia, cercaria) Larval forms of crustacea (nauplius, zoea, megalopa), Larval forms of Echinoderms (bipinnaria, auricularia)

IV Collection and submission of any five specimens (Photograph / Specimen)

Books for Reference

1. Nair, N.C., Arumugam, N., Leelavathi, S., Soundara Pandian, N., and T. Murugan.
2013. *Practical Zoology Vol. 1 Invertebrata*. Saras Publication, Nagercoil.
2. Richard A. Boolootain and Donald Heyneman. 1977. *An Illustrated Laboratory Text in Zoology*. Holt, Rinehart and Winston U S A.

| SEMESTER II | | | |
|-----------------------|-------------------|--------------------|------------------|
| Core III | | Chordata - I | |
| Code: 18UZOC21 | Hrs/Week:4 | Hrs/Sem: 60 | Credits:4 |

Vision

To provide knowledge on the organization and diversity of chordates up to class Amphibia.

Mission

To impart information on the anatomy and morphology of chordates from evolutionary point of view.

Course Outcomes:

| CO.No | Upon completion of this course, students will be able to | PSO addressed | CL |
|--------------|--|----------------------|-----------|
| CO-1 | acquire knowledge on the fundamental organization of chordates. | 1 | Un |
| CO-2 | understand the functional organization and taxonomic position of animals | 2 | Un |
| CO-3 | impart information on the basic concepts of chordate diversity | 1 | Un |
| CO-4 | analyse the characters of different classes | 2 | An |
| CO-5 | learn and identify the major groups within the phylum chordate | 1 | Un |
| CO-6 | reason out the inclusion of different representative animals in particular class | 8 | An |
| CO-7 | recognize the different structural organizations from evolutionary point of view | 8 | Ev |
| CO-8 | compare the anatomy of different functional systems in chordate. | 2 | Ap |

| SEMESTER II | | | |
|----------------|--------------|-------------|-----------|
| Core III | Chordata – I | | |
| Code: 18UZOC21 | Hrs/Week:4 | Hrs/Sem: 60 | Credits:4 |

Unit I Protochordates

Introduction - General characters of Chordates and Prochordates, classification upto Classes with examples

Prochordata: General characteristics and classification upto orders with examples.

Type study- *Amphioxus*- external morphology-digestive and excretory system

Anscidia -Solitary and Colonial. External feature and retrogressive Metamorphosis

Unit II Cyclostomata and Agnatha

General characters, Type study- *Petromyzon*, Agnatha – General characters and Classification, Representative types

Unit III Pisces

General characters And classification upto sub-classes with examples, Detailed study – Shark (excluding endoskeleton), General topic: Migration of fishes

Unit IV Amphibia:

General characteristics and classification upto orders with examples, Type study: Frog –External morphology, skin, digestive, respiratory, circulatory and nervous systems, reproductive system, General topic: Parental care in Amphibia

Unit V Comparative Anatomy

Circulatory system – Evolution of heart and aortic arches, venous system and lymphatic system

Text Books

1. Thangamani. A., PrasannaKumar, S., Narayanan, L.M. and N.Arumugam. 2006. *Chordata*. Saras Publication.
2. Jordan E.L. and P.S. Verma. 2006. *Chordate Zoology*. S.Chand & Co Ltd, NewDelhi.

Books for Reference

1. Ekambaranatha Iyer, M. and T.N S. Ananthakrishnan. 1969. *Manual of Zoology Vol II* Viswanathan Pvt Ltd.
2. Newman, H.H. 1987. *The Phylum Chordata*. Satish Book Enterprise, Motikala.
3. Prasad, S.N. 2005 .*Vertebrate Zoology*. Kitab Mahal Private Ltd, Allahabad.
4. Vishwanath.1967. *A Text Book of Zoology Volume II* [Chordates]. S.Chand & Co. Madras.

| SEMESTER II | | | |
|----------------|---------------|-------------|-----------|
| Core IV | Chordata - II | | |
| Code: 18UZOC22 | Hrs/Week:4 | Hrs/Sem: 60 | Credits:4 |

Vision

To provide knowledge on the organization and diversity of Chordates from the class Reptilia to Mammalia.

Mission

To impart information on the anatomy and morphology of chordates from evolutionary point of view.

Course Outcomes:

| Co.No | Upon completion of this course, students will be able to | PSO addressed | CL |
|-------|---|---------------|----|
| CO-1 | know the chordate diversity | 1 | Un |
| CO-2 | aware of the origin of chordates | 2 | Un |
| CO-3 | learn and recognize the major characteristics of chordates | 1 | Un |
| CO-4 | analyse the morphology of major classes of chordate | 2 | An |
| CO-5 | understand the various systems in the body of chordates | 2 | Un |
| CO-6 | analyse the advancement of functional organization of chordates | 8 | An |
| CO-7 | examine and understand the comparative anatomy of the functional systems in chordates | 8 | Ev |
| CO-8 | apply the knowledge of representative animals to understand the evolution | 2 | Ap |

| SEMESTER II | | | |
|----------------|---------------|-------------|-----------|
| Core IV | Chordata - II | | |
| Code: 18UZOC22 | Hrs/Week:4 | Hrs/Sem: 60 | Credits:4 |

Unit I Introduction to Chordates , Reptilia

Origin of Chordates, General characteristics and classification upto orders. Type study – *Calotes* – External morphology, circulatory system and nervous system. Identification of poisonous and non-poisonous snakes of South India,

Unit II Aves

General characteristics and classification up to subclasses, Type study - *Columba livia* – External characters, exoskeleton, flight muscles, respiratory system, synsacrum. General topic: Migration in birds

Unit III Mammalia

General characteristics and classification up to sub – classes with examples. Type study: Rabbit – Morphology – dentition – digestive system – respiratory system – structure of heart, urino-genital system. General topic: Adaptations of aquatic mammals.

Unit IV Comparative Anatomy

Respiratory system – skin, gills, lungs, air sacs, air bladder and accessory respiratory organs in fish. Mechanism of breathing.

Unit V Sense Organs

Classification of receptors, structure and working of mammalian eye and ear

Text Books

1. Thangamani, A., PrasannaKumar, S., Narayanan, L.M. and Arumugam.N
2006. *Chordata.*, Saras Publication.
2. Jordan E.L. and P.S. Verma. 2006. *Chordate Zoology.* S.Chand & Co Ltd,
NewDelhi.

Books for Reference

1. Ekambaranatha Iyer, M. and T.N S.Ananthakrishnan. 2000. *Manual of Zoology Vol II*
ViswanathanPrinters & Publishers Pvt Ltd, Chennai.
2. Newman, H.H. 1987. *The Phylum Chordata.* Satish Book Enterprise, Motikala.
3. Prasad S.N. 2005 .*Vertebrate Zoology.* Kitab Mahal Private Ltd, Allahabad.
4. Vishwanath. 1967. *A Text Book of Zoology.* Volume II [Chordates] S.Chand & Co.
Madras.

PRACTICALS

Hrs / Week – 2

Credit-1

1. Dissections and mountings:

- Fish - Digestive system
- Frog - Arterial system (Chart)
- Frog - Venous system (chart)
- Shark - Placoid scales
- Teleost fish - Ctenoid and cycloid scales
- Frog - Brain (Chart)
- Feathers - Observation of barbs and barbules

2. Museum specimens: slides/models/charts.

Prochordata - *Amphioxus*, *Balanoglossus*, Ascidian

Agnatha - *Petromyzon*

Pisces - Shark, Eel, *Narcine*, *Hippocampus*,

Amphibian - *Rhacophorus*, Salamander, *Ichthyophis*

Reptilia - *Draco*, *Typhlops*, Cobra, *Krait*, *Dryophis*, Chameleon

Aves - Pigeon, Quill feather, Kingfisher, *Archaeopteryx*

Mammal - Bat, Rabbit, Platypus

Osteology – Pigeon- Synsacrum, Rabbit- Pectoral and Pelvic girdles

3 Collection of any five locally available fishes.