

SEMESTER - I
Core paper - II
INVERTEBRATA - II

Instructional Hrs.: 45 Sub.Code :16ZOUC102

Max. Marks: CIA- 25; ESE-75

Credits : 4

Objectives : To understand habitat, adaptations, organisation and taxonomic status of Invertebrates.

UNIT I

10Hrs.

Phylum Arthropoda : Classification upto orders and their distinguishing characters with suitable examples.

Type study : **Penaeus indicus** (Marine Prawn) - External features- Appendages - Body wall - Body cavity - Digestive system - Circulatory system - Respiratory system - Excretory system - Nervous system - Reproductive system - *Life history*.

UNIT II

8Hrs.

Type study : **Periplaneta americana** (Cockroach) - External features - Body wall- Body cavity - Mouth parts - Digestive system - Blood vascular system - Respiratory system - Excretory system - Nervous system - Reproductive system

General topic : *Beneficial insects.*

UNIT III

9Hrs.

Phylum Mollusca : Classification upto orders and their distinguishing characters with suitable examples.

Type study : **Pila globosa** (Apple snail) - Shell - Body organization- Digestive system - Respiratory system - Circulatory system - Excretory system - Nervous system - *Sense organs* - Reproductive system.

UNIT IV

8Hrs.

Type of study : **Sepia** (Cuttle fish) - External features - Colour change - Locomotion-Digestive system - Ink gland - Respiratory system - Circulatory system - Nervous system -Excretory system - Reproductive system.

General topic : *Economic importance of Mollusca.*

UNIT V

10Hrs.

Phylum	
Echinodermata	: Classification upto orders and their distinguishing characters with suitable examples.
Type study	: Asterias rubens (Star fish) - External features- Pedicellaria structure and function - Digestive system - Respiratory system - Water vascular system - Circulatory system- Excretory system - Reproductive system- <i>Life</i>
General topic	: Larval forms of echinoderms and their evolutionary significance

Note: *Italics* denotes topics for self study.

TEXT BOOK

1. Arumugam N., et.al., *Text book of Invertebrates*, Saras Publication, Nagercoil, 2014.

REFERENCE BOOKS

1. Ekambaranath Ayyar and Anantha Krishnan T.N., *A Manual of Zoology*, Vol.1 (Part I & II), S.Viswanathan Pvt.Ltd., Chennai, 1995.
2. Jordan E.L. and Verma P.S., *Invertebrate Zoology*, S.Chand & Co., New Delhi, 2000.
3. Kotpal R.L., *Modern Text Book of Zoology Invertebrates*, Rastogi Publication, Meerut, India, 2006.
4. Majupuria T.C., *Introduction of Invertebrates*, S.Nagin & Co., Delhi, 1973.

SEMESTER - II
Core Paper - III
CHORDATA

Instructional Hrs: 90 hrs.
Max. Marks : CIA- 25; ESE-75

Sub. Code: 16ZOUC203
Credits: 4

Objective : To understand the diversity, adaptation, organization and taxonomic status of chordates.

UNIT I **25 Hrs.**

Chordata : Classification and General characteristics
Prochordata : Classification and General characteristics
Type study : **Branchiostoma lanceolatum** (Amphioxus) - External features -Body wall - Atrium - Coelom - Notochord - Digestive system - Circulatory system - Excretory system - Nervous system - Reproductive system.

Class Pisces : Salient features-Classification upto orders with two suitable examples

Type study : **Scoliodon sorrakowah** (Shark) - External features - Fins - Placoid scales - Digestive system - Respiratory system - Circulatory system - Nervous system- Sense organs - Urinogenital system.

General topic : *Parental care in fishes.*

UNIT II **15 Hrs.**

Class Amphibia : Salient features- classification upto orders withtwo suitable examples

Type study : **Rana hexadactyla** (Frog) - External features - Sexual dimorphism - Skin - Chromatophores and Colour change - Coelom - Locomotion- Digestive system - Respiratory system - Circulatory system - Nervous system - Sense organs - Urinogenital system - *Life cycle.*

General topics : Neoteny.

UNIT III **15 Hrs.**

Class Reptilia : Salient features- classification upto orders withtwo suitable examples

Type study : **Calotes versicolor** (Garden Lizard) - External features- Body cavity- Digestive system- Respiratory system-

		Circulatory system- Nervous system- Sense organs- Excretory system- Reproductive system.
General topic	:	<i>Poisonous snakes of South India.</i>
UNIT IV	15 Hrs.	
Class Aves	:	Salient features- Classification upto orders with two suitable examples.
Type study	:	Columba livia (Pigeon) External features - <i>Exoskeleton</i> - Digestive system - Circulatory system- Respiratory system- Flight and flight muscles - Mechanism of flight - Nervous system - Sense organs- Excretory system - Reproductive system.
General topic	:	Migration in birds.
UNIT V	20 Hrs.	
Class Mammalia	:	Salient features- Classification upto orders with suitable two examples.
Type study	:	Oryctolagus cuniculus (Rabbit) - External features - Integument - Coelom - Abdominal cavity - Digestive system - Circulatory system- Respiratory system- Nervous system- Sense organs- Urinogenital system.
General topic	:	<i>Aquatic mammals.</i>

Note: *Italics* denotes topics for self study.

TEXT BOOK

1. **Arumugam N., et.al.,** *Text book of Chordates*, Saras Publication, Nagercoil, 2014.

REFERENCE BOOKS

1. **Ekambaranath Ayyar and Anantha Krishnan T.N.,** *A Manual of Zoology*, Vol.2 (Part I & II), S.Viswanathan Pvt.Ltd., Chennai, 1995.
2. **Jordan E.L. and Verma P.S.,** *Chordate Zoology*, S.Chand & Co., New Delhi, 2014.
3. **Kotpal R.L.,** *Modern Text Book of Zoology Vertebrates*, Rastogi Publication, Meerut, India, 2010.
4. **Majupuria T.C.,** *Introduction of Chordates*, S.Nagin & Co., Delhi, 6th Edition 1976.

SEMESTER - I & II
Core Practical - I
(Based on C₁, C₂ and C₃)

Instructional Hrs: 90 **Sub.Code:16ZOUCP01**

Max. Marks: CIA- 40; ESE-60

Credits: 4

LABORATORY EXERCISES:

1. **COCKROACH** - Digestive system, Nervous system, Male and Female Reproductive system (Through charts)

2. **FROG** - Digestive system, Arterial system, Venous system, Male and Female Urinogenital system (Virtual Dissection)

MOUNTINGS:

3. **EARTHWORM** - Body setae
4. **CHICK** - 48 and 72 hours embryo (Slides)

EXPERIMENTS:

5. Culturing and identification of Amoeba.
6. Culturing and identification of Paramecium.
7. Observation - Butterfly Life cycle.
8. Identification and determination of morphometric characters of fresh water fishes. (Any five)
9. Study of metamorphosis in Frog
10. Observation of beak modification in birds.
11. Observation of feet modification in birds.
12. Collection and identification of different types of feathers in birds.

FIELD STUDY - Observation and identification of any 15 insects.
Report must be submitted along with record note book.

SPOTTERS:

A.CLASSIFY GIVING REASONS:

Paramecium, Obelia, Taenia solium, Earthworm, Prawn, Starfish, Shark, Frog, Pigeon, Rabbit.

B.DRAW LABELLED SKETCH :

Obelia medusa, T.S of Earthworm, T.S. of Taenia solium, Frog- Skull (Dorsal view and ventral view), Pectoral and Pelvic girdle.

C. COMMENT ON BIOLOGICAL SIGNIFICANCE:

Sponge gemmule, Physalia, Peripatus, Axolotyl larva, Limulus, Chaemeleon.

D. RELATE STRUCTURE AND FUNCTION:

Spicules of Sponges, Scolex of Taenia, Parapodium of Nereis, Body setae of Earthworm, Mandible of Cockroach, Radula of Pila, Placoid scale, Quill feather.

E. WRITE DESCRIPTIVE NOTES:

Sea anemone, Lepas, Mysis larva, Bipinnaria Larva, Octopus, Hippocampus, Exocoetus, Rhacophorus, Cobra, Bat.

SEMESTER - I

ALLIED ZOOLOGY- PAPER - INVERTEBRATA AND CHORDATA

Instructional Hrs: 60

Sub.Code:16ZOUA101

Max. Marks: CIA-20; ESE-55

Credits: 4

Objective: To acquire a basic knowledge of animal structure and its organization.

UNIT I

8 Hrs

General Characteristics of Phylum Protozoa, Porifera and Coelenterata

Type Study : **Paramecium caudatum** - External features - Nutrition - Locomotion - Reproduction - Asexual - Binary fission, Sexual reproduction - Conjugation, Autogamy, Endomixes, Hemimixes and *Cytogamy*.

UNIT II 12 Hrs

General Characteristics of Phylum Platyhelminthes, Aschelminthes, Annelida and Arthropoda.

Type Study : **Periplaneta americana** (Cockroach) -*External features* - Body wall - Body cavity - Mouth parts - Digestive system - Blood vascular system - Respiratory system - Excretory system - Nervous system - Reproductive system.

UNIT III 10 Hrs

General Characteristics of Phylum Mollusca and Echinodermata

Type Study : **Asterias rubens** (Starfish) - External features - Pedicellaria structure and function - Digestive system - Respiratory system - Water vascular system - structure and function- Circulatory system - Excretory system - Reproductive system - *Life cycle*.

UNIT IV 15 Hrs

General Characteristics of Class Pisces, Amphibia and Reptilia

Type Study : **Scoliodon sorrakowah** (Shark) (Excluding Endoskeleton)- External features - Digestive system - Respiratory system - Circulatory system - Nervous system - Urinogenital system.

UNIT V

15Hrs

General Characteristics of Class Aves and Mammals

Type Study : **Rana hexadactyla** (Frog) (Excluding endoskeleton)- External features - Sexual dimorphism - Locomotion- Digestive system- Respiratory system- Circulatory system- Nervous system- Urinogenital system - *Life cycle*.

Note: Italics denotes topics for self study.

TEXT BOOKS

1. **Thangamani et.al.**, *A Text book of Invertebrates*, Saras Publication, Nagercoil, 2014.
2. **Thangamani et.al.**, *A Text book of Chordates*, Saras Publications, Nagercoil, 2014.

REFERENCE BOOKS

1. **Ekambaranath Ayyar and Anantha Krishnan T.N.**, *A Manual of Zoology Vol I Part I & II*. S.Viswanathan Pvt.Ltd., Chennai, 1992.
2. **Jordan E.L and Verma P.S.**, *Chordata zoology*, Chand & co, New Delhi, 2000.
3. **Kotpal et.al.**, *A Modern text book of Zoology*, Rastogi Publication, Meerut, India, 1989.

SEMESTER - II
Allied Zoology Paper - II
APPLIED ZOOLOGY

Instructional Hrs: 60
Max.Marks. CIA-20; ESE - 55

Sub.Code:16ZOUA202
Credits: 4

Objectives : To acquire adequate knowledge in applied fields of Zoology

UNIT I

AQUACULTURE

Definition - Scope - Types of Aquaculture - Freshwater Aquaculture - Pond, Dam & Lake, Brackishwater Aquaculture - Marine aquaculture - Coastal & Off shore Aquaculture, Management of Fish farms. Culturable organism - Fin fishes. Feed organisms - Algae and Seaweeds. Integrated fish farming - Paddy cum fish culture. Preservation of Fishes - Methods of Preservation.

UNIT II

SERICULTURE

Definition - Scope - History of Sericulture - Types of Silkworm - Tasar, Muga, Eri. Life cycle of Mulberry Silkworm *Bombyx mori*. Rearing Appliances - Rearing stand, Rearing tray, Ant wells, Paraffin paper, Foam rubber strips, Chop sticks, feather. Feeding Appliances - Leaf basket, Leaf chamber, Chopping board, Chopping knife, Mats, Feeding stand. Mountage - Chandrika.

UNIT III

VERMITECHNOLOGY

Definition - Scope - Ecological Classification of Earthworm - Epigeic, Endogeic and Anecic. Life history of Composting Earthworm - *Eudrilus eugeniae*. Methods of Vermicomposting - Pit method and Heap method. Advantages of Vermitechnology - Vermiwash and its Applications.

UNIT IV

APICULTURE

Definition - Scope - Choice of Bee in Apiculture - Desirable traits, Good choice, Poor choice, Best Choice. Kinds of Honey Bee - *Apis dorsata*, *A.florea*, *A. cerana indica*. Development of Honey Bee - Egg, Larva, Pupa and Adult. Bee keeping - Modern bee keeping - Newton Hive. Bee comb - Storage cells, Brood cells, Queen cells, Drone cells, Worker cells. Honey Extraction. Honey - Properties - Chemical composition - Nutritional value - Medicinal value - Honey as food - Bee venom - Bees wax.

UNIT V

HAEMATOLOGY

Blood - Components and functions - Collection of blood - Human blood groups - ABO grouping, Rh system, Determination of bleeding time - clotting time, Haemoglobin estimation by Sahli's method.

REFERENCE BOOKS

1. **Dr.N.Arumugam**, *Aquaculture*, Saras Publication, 2009.
2. **Ganga.G & Sulochana Chetty. J.**, *An Introduction to Sericulture*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 2010.
3. **Bhatnagar & R.K Palta.**, *Earthworm- Vermiculture and Vermicomposting*, Kalyani publishers, Chennai, 2006
4. **Ranganathan L.S.**, *Vermibiotechnology from soil health to human health*, Agrobios (India), 2006.
5. **K.V.Jayashree, Tharadevi C.S., Arumugam.N.**, *Apiculture*, Saras Publication, 2014.
6. **Mukherjee. K.L.**, *Medical Laboratory Technology*, Vol. I, Tata Mc Graw Hill Publishing Ltd., New Delhi, 2004.

SEMESTER I & II
ALLIED ZOOLOGY PRACTICALS

[Based on Papers I & II]

Instructional Hrs: 90
Max.Marks : CIA - 20; ESE - 30

Sub.Code: 16ZOUAP01
Credits: 4

LABORATORY EXERCISES:

1. **COCKROACH** - Mouth parts, Salivary glands, Digestive system, Nervous system, Male and Female Reproductive system (Through charts)
2. **FROG** - Digestive system, Arterial system, Venous system, Male and Female Urinogenital system (Virtual Dissection)

MOUNTINGS:

3. **EARTHWORM** - Body setae

EXPERIMENTS:

4. Blood grouping- ABO and Rh system.
5. Determination of bleeding time.
6. Determination of clotting time.
7. Haemoglobin estimation by Sahli's method

SPOTTERS:

Identify and comment on:

Paramecium, Earthworm, Cockroach, Starfish, Shark, Placoid Scale, Frog, Earthworm - Body setae, Penial setae, Vermicompost, Haemoglobinometer, Antisera A, B and D, Chandrika, Silk gland, Silkworm cocoon, *Catla catla*, *Tilapia mossambicus*, *Panaeus indicus*, Honey bee - Queen, Drones, Workers, Honey, Bee hive, Newton Bee hive.