

## SEMESTER IV

### ZY4B04U CORE COURSE 4 ANIMAL DIVERSITY ♦ CHORDATA

54 Hrs  
3 Credits

#### Objectives

1. To make the student observe the diversity in chordates and their systematic position.
2. To make them aware of the economic importance of some classes.

#### MODULE I

##### Introduction

(1 Hr)

##### Phylum Chordata - General classification

(Classification up to order ♦ Sub phylum, Super class, Class, Subclass, Order)

##### 1. Sub phylum : Urochordata

(3 Hrs)

Class I Larvacea Eg. Oikopleura

Class II Ascidiacea Eg: Ascidia (Mention Retrogressive  
Metamorphosis)

Class III Thaliacea Eg: Doliolum

##### 2. Sub phylum: Cephalochordata

(2 Hrs)

Example - **Amphioxus**

#### Core Readings

Ekambaranatha Iyer 2000 A Manual of Zoology Vol. II .S. Viswanathan and Co.

Young J.Z, 1981, The Life of Vertebrates Oxford University Press.

Young J.Z. 2006 The life of Vertebrates Oxford University Press (Third Ed.) India  
Ed.

## MODULE II

### 3. Sub phylum: Vertebrata

#### 4. Division 1 ♦ Agnatha

(2 Hrs)

Class I Ostracodermi Eg: Cephalaspis

Class II Cyclostomata Eg: Petromyzon

#### Division 2 ♦ Gnathostomata

(10 Hrs)

##### Super class Pisces

##### Class: Chondrichthyes

Sub class - Elasmobranchi Eg: Narcine

Sub class Holocephali Eg: Chimaera

##### Class: Osteichthyes

Sub class ♦ Choanichthyes

Order 1 Crossopterigii Eg: Latimeria

Order 2 Dipnoi Eg: Lepidosiren

Sub class: - Actinopterygii

Super order 1. Chondrostei Eg: Acipenser

Super order 2. Holostei Eg: Amia

Super order 3. Teleostei Eg: Sardine

### General topics

1. Accessory respiratory organs in fish.
2. Parental care in fishes.
3. Scales in fishes.
4. Migration in fishes
5. Common culture fishes of Kerala
6. Lung fishes

### Core Readings

Ekambaranatha Iyer 2000 A Manual of Zoology Vol. !!.S. Viswanathan and Co.

Young J.Z. 2006 The life of Vertebrates Oxford University Press (Third Ed.) India Ed.

Jhingran 1977, Fish and Fisheries of India, Hindustan Publishing Co.

### **MODULE III**

#### **Super class: Tetrapoda**

**(10 Hrs)**

Class Amphibia

#### **Type Frog**

Order I Anura

Eg: Hyla

Order II Urodela

Eg: Amblystoma (Mention  
axolotl larva and neotony)

Order III Apoda

Eg: Ichthyophis.

#### **Class Reptilia**

**(4 Hrs)**

Sub class I: Anapsida

Order Chelonia

Eg: Chelone

Sub class II: Parapsida

Eg: Ichthyosaurus

Sub class III: Diapsida

Order I Rhynchocephalia

Eg: Sphenodon

Order II Squamata

Eg: Chamaleon

Sub class IV: Synapsida

Eg: Cynognathus

#### **General topic**

Identification of poisonous and non poisonous snakes

#### **Class Aves**

**4 Hrs**

#### **Sub class I: Archeornithes**

Eg: Archaeopteryx (Affinities)

#### **Sub class II: Neornithes**

Super order I: Palaeognathe

Eg: Struthio

Super order II: Neognathe

Eg; Brahminy kite

#### **General topics**

1. Migrations in birds
2. Flight adaptations in birds

#### **Core Readings**

Jordan E L and .P.S. Verma, 2002 Chordate Zoology S. Chand and Co. New Delhi.

Ekambaranatha Iyer 2000 A Manual of Zoology Vol.II S. Viswanathan and Co.

### **MODULE IV**

#### **Class Mammalia**

**(18 Hrs)**

## **Type: Rabbit**

Sub class I: Prototheria	Eg: Echidna
Sub class II: Metatheria	Eg: Macropus
Sub class III: Eutheria	
Order 1. Insectivora	Eg: Talpa
Order 2 Dermoptera	Eg: Galeopithecus
Order 3. Chiroptera	Eg: Pteropus
Order 4. Primates	Eg: Loris
Order 5 Carnivora	Eg: Panthera
Order 6 Edentata	Eg: Armadillo
Order 7 Pholibota	Eg: Manis
Order 8 Proboscidea	Eg: Elephas
Order 9 Hydracoidea	Eg: Procavia
Order 10 Sirenia	Eg: Dugong
Order 11 Perissodactyla	Eg: Zebra
Order 12 Artiodactyla	Eg: Cameleus
Order 13 Lagomorpha	Eg: Oryctolagus
Order 14 Rodentia	Eg: Porcupine
Order 15 Tubulidentata	Eg: Orycteropus
Order 16 Cetacea	Eg: Delphinus

### **General topics**

1. Dentition in Mammals
2. Aquatic Mammals

### **Core Readings**

Jordan E L and .P.S. Verma, 2002 Chordate Zoology S. Chand and Co. New Delhi.  
Ekambaranatha Iyer 2000 A Manual of Zoology Vol. !!.S. Viswanathan and Co.  
Zoological Society of Kerala Study material. *Animal Diversity* 2002

### **Selected Further Readings**

Ekambaranatha Iyer 2000 A Manual of Zoology Vol. !!.S. Viswanathan and Co.  
Jhingran 1977, Fish and Fisheries of India, Hindustan Publishing Co.  
Jordan E L and .P.S. Verma, 2002 Chordate Zoology S. Chand and Co. New Delhi.  
Kotpal R.L. 2000, Modern Text Book of zoology, Vertebrates, Rastogi Publications, Meerut.  
Nigam and Sobti 2000, Functional Organization of Chordates. Shoban Lal Nagin Chand and Co. New Delhi.

Young J.Z, 1981, The Life of Vertebrates Oxford University Press.

Young J.Z. 2006 The life of Vertebrates Oxford University Press (Third Ed.) India  
Ed.

**ZY4B04U [P] PRACTICAL 4**  
**ANIMAL DIVERSITY CHORDATA**

**36hrs**  
**Credit 1**

**1. Morphology: Scientific Drawing**

Make scientific drawing of 5 locally available vertebrate specimens belonging to different classes

**2. Dissections**

Frog: Photographs/diagrams/one dissected & preserved specimen each/models may be used for study.

1. Frog Viscera
2. Frog Digestive System
3. Frog Arterial System
4. Frog 9<sup>th</sup> & 1<sup>st</sup> Spinal nerve
5. Frog Sciatic Plexus
6. Frog Brain

Mounting of placoid scales/cycloid/ctenoid scales

**3. Osteology**

Frog vertebrae  
Pectoral and pelvic girdles of Frog and Rabbit  
Skull of Rabbit (Diastema -dentition  
Turtle ♦ plastron and carapace

**4. Study of sections.**

Amphioxus T. S. through pharynx/T.S. through intestine

**5. Identification:-**

**General identification-**

Identify all the animals by their generic names and 25 % of them by their specific names.

Protochordata-1, Pisces-4, Amphibia-3, Reptilia- 4, Aves-1,  
Mammalia-2.

**7. Taxonomic identification with key:-**

- i) Identification of fishes up to the level of order.
- ii) Identification of snakes up to family.