



JYOTI NIVAS COLLEGE AUTONOMOUS BANGALORE – 560 095
DEPARTMENT OF ZOOLOGY
B.Sc. V SEMESTER ZOOLOGY PAPER VI SYLLABUS (2021 NEP BATCH)
DIVERSITY OF CHORDATES AND COMPARATIVE ANATOMY

COURSE TITLE	DIVERSITY OF CHORDATES AND COMPARATIVE ANATOMY
COURSE CODE	21VZL6(T)
COURSE CREDITS	04
TOTAL CONTACT HOURS	60 Hours
DURATION OF ESE	2 ½ Hours
CONTINUOUS INTERNAL ASSESSMENT (CIA)	40 Marks
END SEMESTER EXAMINATION (ESE)	60 Marks

Course Objectives:

1. Differentiate Protochordates, Agnatha and Vertebrates based on their unique characteristics.
2. Describe the systems in certain organisms.
3. To gain knowledge on interesting features and phenomenon exhibited by the vertebrates
4. To compare the Brain, Circulatory, Urinogential, Respiratory and Integumentary systems of Vertebrates and understand their functions

Course Outcomes (COs):

The student at the completion of the course will be able to:

1. Acquire in depth knowledge on the structural and functional diversity of chordates.
2. Demonstrate comprehensive identification abilities of chordate diversity based on their systems.
3. Recognize unique features of different classes of chordates
4. Understand the interesting features and phenomenon exhibited by the vertebrates
5. Comprehend evolutionary relationship amongst chordates.

CO Mapping with Knowledge Levels

CO No.	Course outcomes statement	Knowledge level
1	Acquire in depth knowledge on the structural and functional diversity of chordates.	K1, K2., K3
2	Demonstrate comprehensive identification abilities of chordate diversity based on their systems.	K1, K2., K4
3	Recognize unique features of different classes of chordates.	K1, K2, K3, K4, K5
4	Understand the interesting features and phenomenon exhibited by the vertebrates	K1, K2, K3, K5
5	Comprehend evolutionary relationship amongst chordates	K1, K2, K3, K5, K6

Knowledge Levels- K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of Course Outcomes (COs) with Program Outcomes (POs)

	CO1	CO2	CO3	CO4	CO5
PO1	✓	✓	✓	✓	✓
PO2	✓	✓	✓	✓	✓
PO3		✓			
PO4	✓	✓	✓	✓	✓
PO5					
PO6					
PO7	✓	✓	✓	✓	✓
PO8	✓	✓	✓	✓	
PO9		✓			✓
PO10	✓	✓	✓	✓	✓

Program Objectives aligned with Graduate attributes

PO1- Knowledge, PO2- Scientific thinking, PO3- Entrepreneurial skills
 PO4- Analytical skills , PO5- Communication skills, PO6- Social commitment
 PO7- Research and Inquiry , PO8- Conservation of Environment\
 PO9- Employability, PO10- Academic orientation

Unit 1. Origin of Chordates**6 Hrs.**

- Origin of Chordates. Salient features and classification of Phylum Chordata upto classes.

Unit 2. Cephalochordata Urochordata and Agnatha**8 Hrs.**

- Cephalochordata : General characteristics
- Amphioxus - Morphology, feeding and digestion.
- Urochordata : General characteristics
- Ascidia - Morphology, Ascidian tadpole larva and retrogressive metamorphosis.
- General characters - Agnatha and outline classification up to orders
- Cyclostomata: General Characters and classification with examples

Unit 3. Pisces and Amphibia**9 Hrs.**

- Super Class Pisces-General characters and outline classification up to classes
- Dipnoi- Unique features and evolutionary significance
- Migration in fishes. Catadromous migration – Eel, Anadromous migration – Salmon
- Class Amphibia-General characters and classification of living orders with suitable examples
- Frog (*Rana* sp.): Digestive system including buccal cavity, Respiratory system and types: (Cutaneous respiration, Buccal respiration and Pulmonary respiration), Urinogenital system – male; Reproductive system - female

Unit 4. Reptilia and Aves**10 Hrs.**

- Class Reptilia-General characters and classification of living orders with suitable examples
- Arcades and fossae in the Reptilian skull
- Adaptive radiation in Extinct reptiles
- Poison apparatus, venom composition, its effects , First aid for snakebite
- Class Aves-General characters and classification up to subclasses.
- Flight adaptations of birds
- Migration– Types and theories, routes and problems,, Ringing and radio-collaring techniques (mention the negative impact of these techniques), Modern technique-remote sensing .

Unit 5. Mammalia**7 Hrs.**

- General characters and classification up to orders with suitable examples
- Special features - Prototheria, Metatheria and Eutheria.
- Interesting features - Cetacea, Chiroptera, Proboscidea, Carnivora, and Primates

- Unit 6. Comparative anatomy of vertebrates -I** **7 Hrs.**
- Evolutionary trends- Integumentary system - Fish, Frog, Lizard, Pigeon and Rabbit
 - Evolutionary trends in the structure of Brain: Shark, Frog, Pigeon and Rabbit.
- Unit 7. Comparative anatomy of vertebrates-II** **6 Hrs.**
- Evolutionary trends in the heart: Shark, Frog, Lizard, Pigeon and Rabbit
 - Evolutionary trends in the aortic arches: Fish, Frog, Lizard Pigeon and Rabbit
- Unit 8. Comparative anatomy of vertebrate – III** **7 Hrs.**
- Evolutionary trends in the respiratory system: Fish, Frog, Lizard, Pigeon and Rabbit with special reference to modifications of the pharynx
 - Evolutionary trends in the Urinogenital system: Pronephros, Mesonephros and Metanephros.

ZOOLOGY PRACTICAL PAPER–VI

COURSE TITLE	DIVERSITY OF CHORDATES AND COMPARATIVE ANATOMY
COURSE CODE	21VZL6 (P)
COURSE CREDITS	02
TOTAL CONTACT HOURS	4 hours/week
DURATION OF ESE	03 hours
CONTINUOUS INTERNAL ASSESSMENT (CIA)	25 Marks
END SEMESTER EXAMINATION (ESE)	25 Marks

Experiments

1. **PROTOCHORDATA: Specimens** - Amphioxus & Ascidia, Slides of:- T.S of Amphioxus through pharynx and intestine
2. **AGNATHA: Specimens** – Petromyzon, Myxine and Ammocoete larva
3. **PISCES: Museum specimens** - *Narcine*, *Trygon*, *Ostracion*, *Muraena*, *Diodon*, Hippocampus (male and female) and *Echeneis*
4. **AMPHIBIA: Museum specimens** - *Bufo*, *Hyla*, Ambystoma. Axolotl larva, Necturus and Ichthyophis

5. **REPTILIA:** Turtle, Chameleon, Draco, Varanus . Snakes of South India: Hydrophis, Cobra, Krait and Viper.
6. **AVES:** *Anas platyrhynchos* -Duck, *Psittacula eupatria* - Parakeet, *Dryocopus pileatus* - Woodpecker & *Alcedo atthis* - Kingfisher
7. **MAMMALIA:** *Chiroptera sps.*- Bat, *Funambulus palmarum*- Squirrel, *Oryctolagus cuniculus* - Rabbit, *Paraechinus micropus* - Indian Hedgehog and *Loris tardigradus* -Loris
8. **Mounting of Fish scales** (Placoid, Cycloid and Ctenoid)
9. **COMPARATIVE ANATOMY:** Heart of Shark, Frog, Pigeon and Rat.
10. **COMPARATIVE ANATOMY:** Brain of Shark, Frog, Pigeon and Rat

References

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3. Analysis of Vertebrate Structure Hildebrand: (4th ed 1995, John Wiley)
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6. TextBook of Zoology, Vol. II (1978, ELBS) Parker and Haswell
7. The Vertebrate Body (6th ed 1986, CBS Publishing Japan) Romer and Parsons
8. The Life of Vertebrates (3rd ed 2006, ELBS/Oxford) Young
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