KUVEMPU UNIVERSITY

JNANA SAHYADRI

Syllabus

(According to SEP 2024)

for the B.Sc Course in Zoology

SEMESTER SYSTEM

With effect from the Academic Year

2024-2025

Course Structure of B.Sc., Zoology

Semester	Course Code	Theory courses	Teaching / week	IA	Sem. end Exam	Total	Credits
1	Zoo-1T	Diversity of Non-Chordates	3 hrs.	20	80	100	3
	Zoo-1P	Diversity of Non-Chordates	4 hrs.	10	40	50	2
2	Zoo-2T	Diversity of Chordates & Comparative Anatomy	3 hrs.	20	80	100	3
	Zoo-2P	Diversity of Chordates & Comparative Anatomy	4 hrs.	10	40	50	2
3	Zoo-3T	Physiology & Biochemistry	3 hrs.	20	80	100	3
	Zoo-3P	Physiology & Biochemistry	4 hrs.	10	40	50	2
	ZooEL3-1	Parasitology	2 hrs.	10	40	50	2
	ZooEL3-2	Occupational Zoology	2 hrs.	10	40	50	2
	ZooEVS	Environmental Studies (EVS) -1	2 hrs.	10	40	50	2
4	Zoo-4T	Environmental Biology, Ethology & Biostatistics	3 hrs.	20	80	100	3
	Zoo-4P	Animal Behaviour	4 hrs.	10	40	50	2
	ZooEL4-1	Endocrinology	2 hrs.	10	40	50	2
	ZooEL4-2	Occupational Zoology	2 hrs.	10	40	50	2
	ZooAEDP-1		2 hrs.	10	40	50	2
5	Zoo-5T	Evolution, Genetics & Biotechnology	3 hrs.	20	80	100	3
	Zoo-5P	Evolution, Genetics & Biotechnology	4 hrs.	10	40	50	2
	ZooAEDP-2		2 hrs.	10	40	50	2
6	Zoo-6T	Evolution, Genetics & Biotechnology	3 hrs.	20	80	100	3
	Zoo-6P	Evolution, Genetics & Biotechnology	4 hrs.	10	40	50	2
	ZooAEDP-3		2 hrs.	10	40	50	2
					Total	1200	42

Kuvempu University
Bachelor of Science (B.Sc. Degree) Semester Scheme
Zoology Syllabus (SEP- 2024-25)

Major Course (ZOO-1T) Paper 1: **Diversity of Non-chordates**

Learning objectives:

1. To know the general characters and classification of non chordates.

2. To understand the structural organization of animals phylum from protozoa to echinodermata.

3. To identify the taxonomic status of the entire non- chordates and discuss the evolutionary model of the group.

4. To know about some of the important and common protozoans, helminthes and arthropods of parasitic nature causing diseases.

5. To understand the biology of important non-chordates.

Learning Outcomes:

By the completion of the course the graduate should be able to

1. Describe the lifecycle and biology of selected non-chordates.

2. Relate the characteristic features of parasitic helminthes with its adaptations.

3. Describe the concept of animal kingdom classification and general characters.

Unit-I16 Hours

1.Animal Architecture: i) Body symmetry- types-spherical symmetry, radial symmetry, biradial symmetry and bilateral symmetry. ii) Organization- the hierarchical organization of protoplasmic level, cellular level, tissue level and organ level of organization. iii)Germ layers- diploblastic and triploblastic condition. iv)Coelom- origin and types– acoelom, pseudocoelom, eucoelom (enterocoelom and schizocoelom). v)Metamerism- types – pseudometamerism, true metamerism. vi)Cephalization.

2.Protozoa: General characters and classification up to classes with examples. Structure and life history of ***Plasmodium vivax***, locomotion and reproduction in protozoa.

3. Porifera: General characters and classification up to classes with suitable examples. Skeleton in Sponges, Canal system (*Ascon, Sycon, Leucon & Rhagon type*).

4. Coelenterata: General characters and classification up to classes with suitable examples. Structure and life cycle of Obelia, polymorphism in Coelenterates.

Unit-II 16 Hours

5. Platyhelminthes: General characters, classification up to classes with suitable examples, Taenia solium (Morphology and Reproduction); parasitic adaptations in Platyhelminthes.

6. Nemathelminthes: General characters, classification up to classes with suitable examples. ***Ascaris lumbricoides*** (Lifecycle & Pathogenecity)

7. Annelida: General characters and classification up to classes with suitable examples. ***Hirudinaria granulosa*** (external features, digestive system, excretory system, reproductive system and parasitic adaptations).
Affinities & systematic positions of Onychopora.

Unit-III 16 Hours

8. Arthropoda: General characters, classification up to classes with suitable examples. *Penaeus* (External features, appendages, nervous system and reproductive system). A brief account on metamorphosis in insects.

9. Mollusca: General characters and classification upto classes with suitable examples. Type study: Unio (Structure, Respiratory system and Circulatory system); Foot and shell modifications, Economic importance of Molluscans. Pearl and Oyster culture.

10. Echinodermata: General characters and classification upto classes with suitable examples. ***Asterias*** (Morphology and water vascular system). Larval forms- Bipinnaria, Ophioplatus and Auricularia.

First Semester Zoology Practical: Diversity of Non-chordates

02 Credits **4hours/week**

I. Study of Compound microscope -Eye piece, Objective, Condenser, mirror, Stage, Frame, Knobs.

2. **Protozoa:** Observation of Protozoans from culture stocks. Study of permanent slides of Protozoa- Amoeba, Polystomella, Plasmodium, Euglena, Paramecium.

3. **Porifera:** Sycon, Hyalonema, Spongilla, Sponge gemmules and spicules

4. **Coelenterata**: Hydra, Obelia, Aurelia, Sea anemnone, Fungia, Madrepora, Physalia, Gorgonia.

5. **Platyhelminthes:** Planaria, Liver fluke, T.S. of Liver fluke, Taenia solium (male and female), Scolex of tape worm: Ascaris (male and female)

6. **Aschelminthes**: Ascaris (male and female), Ancylostoma, Wuchereria bancrofi.

7. **Annelida :** Earth worm, Nereis, T.S.of Nereis, Aphrodite, Leech. Onychopora: Peripatus

8. **Arthropoda:** Hermit crab, Sacculina, Scolopendra, Scorpion, Nauplius, Zoea and Mysis larva, Lepisma

i. Study of Arthropodan pests- Periplanata, Rhinoceros Beetle
ii. Study of Arthropodan Vectors- Mosquitoes, House fly
ii. Study of beneficial insects- Honey bee, Butterfly

9. Field study- observations and recording of Arthropodan at your vicinity (minimum 5species)

10. **Mollusca:** Mytilus, Unio, Octopus, Nautilus, Sepia, Glochidium larva, Chiton, Dentalium.

11. **Echinodermata**: Astropecten, Ophiothrix, Sea cucumber, Echinus, Antedon, Bipinnaria larva

12. **Demo/Mountings/Dissections:** Dead and commercially available animals in the local market can be demonstrated/ dissected. Animals like leech/Prawn or Cockroach may be used.

1. **Prawn**- Appendages and nervous system

2. **Leech**-digestive system, reproductive system and mounting of jaws

3. **Cockroach**- Digestive system, Nervous system, mounting of Salivary gland & mouthparts

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4. Borradaile L.A, Potts E.A and Kerkut G.A (1977), The Invertebrates, Cambridge University Press.

5. Claude.A.Villee and Fredrick E. Smith et.al (1968), General Zoology, III ed"W.B.Saunders Company, Philadelphia.

6. Dhami P.S & Dhami J.K, (1964), Invertebrate Zoology, S.Chand & Co Delhi

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11. Robert W. Hegner and Karl. A. Stiles (1955), College Zoology, 6l edition, Macmillan Company, New York.

12. Verma.P.S (1999), A manual of practical Zoology- invertebrates, 15" edition. S.Chand Co.Ltd. New Delhi.

Major Course (ZOO-2T) Paper 2: **Diversity of Chordates & Comparative Anatomy**

Learning objectives:

1. To know the general characters and classification of chordates.

2. To understand the biology of important chordates.

3. To know the comparative anatomy of different classes of chordates.

Learning Outcomes:

By the completion of the course the graduate should be able to

1. Describe the lifecycle and biology of selected chordates.

2. Relate the characteristic features of different classes of chordates.

3. Describe the concept comparative anatomy of different classes of chordates.

Unit-I16 Hours

1. Introduction to Chordates: General characteristics and outline classification

2. Protochordata: General Characteristics of subphylum ***Hemichordata*** **(**Type study of ***Balanoglossus***- Morphology, coelom. Tornaria larva and its affinities), ***Urochordata*** (Type Study of ***Herdmania***-Morphology; Ascidian Tadpole Larva- structure and retrogressive metamorphosis), ***Cephalochordata*** (Type study of ***Branchiostoma***- Distinctive features).

3. Agnatha: General characters and classification of cyclostomes up to classes.

4. Gnathostomata: General characters of Pisces with examples. Difference between Chondrichthyes and Osteichthyes, Type study of ***Scoliodon***- External features, respiratory and urinogenital systems, and salient features of Dipnoi fishes (Lung fishes).

Unit-II 16 Hours

5. Amphibia: General characters and classification up to orders with examples. Type study of ***Rana hexadactyla***- Morphology, digestive, respiratory and urinogenital system (male and female). Neotony,Pedogenesis,Origin of tetrapoda.

6. Reptilia: - General characters and classification up to orders with examples, key for the identification of poisonous and non Poisonous snakes, poison apparatus and Biting mechanisms in snakes.

7. Aves: General characters. Distinctive features of Archaeornithes And neornithes with reference to paleognathae, Impennae and Neognathae with examples. Volant Adaptation, a brief account on beak and feet modification in birds.

Unit-III 16 Hours

8. Mammals: General characters and classification up to orders with examples. Type Study of ***Rabbit***- Morphology, digestive, respiratory and urinogenital systems (male. and female). Dentition in mammals: Structure of tooth, different types of teeth and specialization Dental formula of Carnivore (Dog), Herbivore (Cattle) and Omnivore (Man).

9. Comparative Anatomy: Evolution of Aortic arches in Vertebrates- Comparative account on Pisces, Amphibia, Reptilia, Aves and Mammalia. Evolution of heart in Vertebrates- Comparative account on Pisces (Shark), Amphibia (frog). Reptilia(lizard), Aves (pigeon) and Mammalia(man). Comparative account on Pronephros, mesonephros and metanephrous kidney.

Second Semester Zoology Practical: Diversity of chordates & Comparative Anatomy

02 Credits **4hours/week**

1. **Protochordates:** Herdmania, Balanoglossus, Amphioxus, T.S. through pharynx of

Amphioxus, Petromyzon, Ammocoetes larva and Myxine.

2. **Pisces:** Zygaena, Pristis, Echeneis, Torpedo, Hippocampus, Synaptura, Eel, Carps and Mackerels

3. **Amphibia:** Ichthyophis, Ambystoma, Axolotl larva, Bufo, Rhacophorus and Hyla.

4. **Reptilia:** Calotes, Chamaeleon, Draco, Varanus, Naja, Python, Bungarus, Hydrophis, Viper, Crocodile and Turtle

5. **Aves:** Parrot, Owl, Wood pecker, King Fisher, Pigeon, House Sparrow.

Field study- Observations and recording of any five birds at your vicinity (Minimum 5 species).

6. **Mammalia:** Echidna, Ornithorhynchus, Macropus, Loris, and Pangolin

7. **Comparative anatomy:**

Heart and brain of shark, frog, Lizard. Pigeon and rabbit. Skull of Shark, frog,

crocodile, pigeon and rabbit, Vertebrae (Atlas, Procoelous, Amphicoelous, Acoelous) of

frog and pigeon. Girdles and limb skeleton of frog and rabbit, comparative anatomy of brain.

8. Demonstaration – Commercially available dead animals in the local market can be used for demonstration/ dissection.(Shark)

1. **Shark**-afferent and efferent arterial system

2. Cranial nerves and mounting of brain.

3. mounting of scales (placoid, cycloid ctenoid)

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