



# ST. ALOYSIUS COLLEGE (AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC (CGPA:3.68/4.00)

College with Potential for Excellence by UGC

DST-FIST Supported & STAR College Scheme by DBT

## Faculty of Science

Bachelor of Science (B.Sc.)

Session – 2024-25

**SUBJECT: ZOOLOGY**

B.Sc. III Semester

Course Title - Diversity of Chordates and Comparative Anatomy

Core Course – Minor (Zoology)

### Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO 1	Understand chordate diversity of animals and their taxonomic positions.	U, ANALYSE
CO 2	Identify the morphological and anatomical features and basis of chordate classification.	K
CO 3	Know economic importance and present status that will develop a positive attitude towards conservation of biodiversity.	U
CO 4	Differentiate the organism belonging to different taxa, by studying comparative anatomy.	U, APPLY
CO 5	The project, assignment will give them a flavour of research in studying biodiversity, taxonomy besides improving their writing skills and lay the foundation of a career in Zoology.	U, CREATE

### Credit and Marking Scheme

	Credits	Marks		Total Marks	Min Passing Marks
		Internal	External		
Theory	4	40	60	100	35
Practical	2	40	60	100	35
Total	6				



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## Evaluation Scheme

	Marks	
	Internal	External
<b>Theory</b>	3 Internal Exams of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exam (At the End of Semester)
<b>Practical</b>	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exam (At the End of Semester)

## Content of the Course

### Theory Syllabus

No. of Lectures (in hours per week): 2 hours per week

Total No. of Lectures: 60 hrs.

Maximum Marks: 60

Units	Topics	No. of Lectures
I	<b>1. Introduction to Chordates</b> 1.1 Traditional Knowledge on Animal Science in ancient Indian Civilization 1.2 Origin of Chordates, General characteristics and outline classification of Phylum Chordata up to orders according to Parker and Haswell, Seventh Edition <b>2. Protochordata</b> 2.1 General characteristics and classification of Sub- Phylum Urochordata and Cephalochordata. 2.2 Type study of Herdmania and retrogressive metamorphosis in ascidian tadpole. . 2.3 Type study of Amphioxus and its Affinities. <b>3. Agnatha</b> 3.1 Comparison of Petromyzon and Myxine. Keywords/Tags: Chordata, Herdmania, Amphioxus, Cephalochordata, Petromyzon.	12





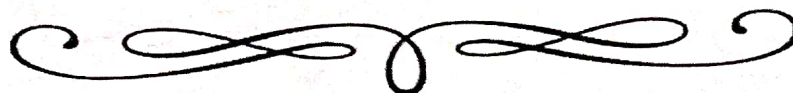
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II	<p><b>1. Pisces</b> 1.1. General characteristics and classification of Pisces. 1.2. Accessory respiratory organs, Parental care in fishes.</p> <p><b>2. Amphibia</b> 2.1 General characteristics and classification of Amphibia. 2.2 Parental Care in Amphibia and Paedomorphosis</p> <p><b>3. Reptilia</b> 3.1. General Characteristics and classification of Reptilia. 3.2. Difference between Poisonous and Non-Poisonous snakes, Venom and Antivenom 3.3. Poison apparatus and biting mechanism in snake. <b>Keywords/Tags:</b> Pisces, Parental care, Amphibia, Reptiles, Poison apparatus.</p>	12
III	<p><b>1. Aves</b> 1.1 Brief Introduction of &amp; Birdman of India - Dr. Salim Ali 1.2 General characteristics and classification of Aves. 1.3 Migration of birds, principles and aerodynamics of flight. 1.4 Flight adaptation in birds.</p> <p><b>2. Mammalia</b> 2.1 General characteristics and classification of mammals. 2.2 Adaptive radiation in mammals with reference to locomotory appendages. 2.3 Introduction of ZSI (Zoological Survey of India) <b>Keywords/Tags:</b> Aves, Aerodynamics, Flight Adaptation, Mammalia, Adaptive Radiation, Locomotory Appendages. .</p>	12
IV	<p><b>Comparative Anatomy of Vertebrates.</b> 1. Comparative study of integument and its derivatives of Vertebrates. 2. Comparative study of appendicular skeleton (Limb and girdles) of Vertebrates. 3. Comparative study of digestive system of Vertebrates. 4. Comparative study of respiratory system of Vertebrates <b>Keywords/Tags:</b> Integument, Derivatives, Girdles, Digestive System, Respiratory System.</p>	14
V	<p><b>Comparative Anatomy of Vertebrates.</b> 1. Comparative study of aortic arches and heart of Vertebrates. 2. Comparative study of Brain of Vertebrates. 3. Comparative study of Urinogenital System of Vertebrates 4. Study of Eye and Ear of mammals <b>Keywords/Tags:</b> Heart, Brain, Kidney, Urinogenital System, Eye, Ear. Embryo membranes</p>	10





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## Text Books, Reference Books

1. Lal, S.S. Vertebrate Practical Zoology 11 Revised edition, Rastogi publications, Meerut (2009).
2. Sharma, Vijay Laxmi. ;Practical Zoology, Paragon industrial publication (2004)
3. Verma P.S., Manual of Practical Zoology — Chordates S. Chand Co. Ltd. 11<sup>th</sup> Edition (2010).
4. Prakash, M.,Arora, C.K., Laboratory animals, Anmol Publications, New Delhi (1998).
5. Yadav & Varshney, Practical Zoology, Kedarnath Ramnath (2015).
6. लाल, एस. एस. “प्रयोगात्मक प्राणी विज्ञान – कशेरुकी” रस्तोगी प्रकाशन, मेरठ
7. अंसारी एस. एस., डॉक्टर कोहली, के., जैन, नरेंद्र, भाटिया, ए. एल., “प्रायोगिक प्राणी विज्ञान” आर. बी. डी. पब्लिकेशन
8. Books Published by MP Hindi Granth Academy, Bhopal.

## Suggested equivalent online courses/ Other resources:

1. <https://en.wikipedia.org/wiki/Chordate>
2. <https://www.youtube.com/watch?v=BBfdzpdNh70>
3. <https://www.youtube.com/watch?v=6GbJWJ3Swsc>
4. <http://www.ignotthelp.in/ignou-Ise-08-study-material-in-hindi/>
5. <https://www.mphindigranthacademy.org/>





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## Practical Syllabus

Total No. of Lectures: 30 hrs.

Maximum Marks: 60

S,NO.	Topics	No. of lectures
1.	<b>Study of museum specimens</b> 1. Protochordata: Herdmania, Amphioxus 2. Fishes: Scoliodon, Stegostoma, Torpedo, Heteropneustes, Labeo, Exocoetus, Hippocampus, Anabas, Eel, Flat fish. 3. Amphibia : Necturus, Bufo , Rana, Salamander, Hyla, Axolotl larva, Mid Wife Toad, Ichthyophis 4. Reptilia : Chelone, Trionyx, Hemidactylus, Varanus, Chameleon, Draco, Viper, Raja, Hydrophis. 5. Aves : Local Birds, Vulture, Great Indian Bustard, Lesser Florican 6. Mammalia : Bat, Funambulus, Platypus, Rat,	6
2.	<b>Study of Histological slides -</b> T.S. of Duodenum, Stomach, Small Intestine, Liver, Pancreas, Testis, Ovary, V.S. of skin, L.S. of Kidney of vertebrates	2
3.	<b>Osteology - Study of Limb Bones and Girdles of Vertebrates (Amphibia, Reptilia, Aves, Mammalia).</b>	3
4.	Study of different types of feathers/ beaks of birds at local level.	2
5.	Dissection of Local fish (Only demonstration of commercially available local fish / Through computer simulation method/through You tube videos / through models and charts. a) General Viscera, Arterial System b) Cranial nerves V, VII, IX and X	8
6.	Mounting of scales of fishes	2
7.	Study of local bird fauna of surrounding area (College campus/ Village/Garden/ Ward)	2
8.	Comparative study of heart and brain of vertebrates	3
9.	Collection	2

Keywords/Tags: Protochordates, Duodenum, Girdles, Feathers, Cranial nerves, Brain, Birds



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SCHEME OF PRACTICAL EXAMINATION			
Internal Assessment	Marks	External Assessment	Marks
Class Interaction/Quiz	10	Viva Voce on Practical	10
Attendance	10	Practical Record File	10
Assignments (Charts/Model/ Seminar/Rural Service/Technology Dissemination/ Report of Excursion/lab Visits/Survey/Industrial visit	20	<b>Table Work/Experiments</b>	<b>40</b>
		1- Spotting (museum specimens, slides and bones)	16
		2. Dissection	
		Major	08
		Minor	04
		3. Mounting	04
4. Comment on comparative study (Models and Charts of organs, Systems) Any two	04		
5. Identification and comment on feather / beak of bird (any 2- Photograph/ model/chart)	04		
6. Collection			04
<b>TOTAL</b>	<b>40</b>		<b>60</b>

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