



# बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

## School of Science B.Sc. (Zoology) Programme

**Subject Code & Name: BS03MDZOO3 Zoo-Geography and Adaptations**

### Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage (%)			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
3	0	1	4	35	15	35	15

Programme Name	B.Sc. (Zoology)
Semester	III
Course Code	BS03MDZOO3
Course Title	Zoo-Geography and Adaptations
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	4
Sessions+ Lab. Per Week	3 + 2
Total Teaching/Lab. Hours	45 Theory Hours+ 30 Practical Hours
* 2 Laboratory = 1 Session	

### Learning Objectives

This course combines the study of the geographic distribution of animals (zoogeography) with their adaptive strategies to survive in different environments.

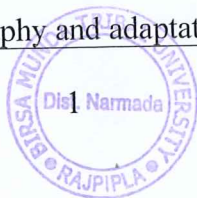
1. To study the distribution of animals in different regions of the world.
2. To understand about physiological adaptations animals in different habitats.
3. To learn the ecological adaptations of Animals.

To get practical knowledge about zoogeography and adaptations with examples.

### Learning Outcomes

On the Completion of this course, students will able:

1. To understand the principles and methods of zoogeography and how animals are distributed globally.
2. To explore the environmental and evolutionary factors that affect the geographic range of species.
3. To study animal adaptations (physiological, morphological, and behavioral) to various habitats and ecological challenges.
4. To examine case studies of specific animals and ecosystems for better understanding of adaptation and distribution patterns.
5. To integrate knowledge of zoogeography and adaptations in evolutionary biology.







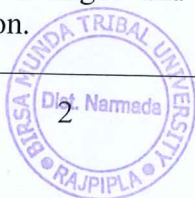
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## School of Science B.Sc. (Zoology) Programme

Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	<b>Animal Distribution:</b> <ul style="list-style-type: none"><li>• <b>Pattern of distribution:</b> Cosmopolitan, Discontinuous, Endemic distribution, Isolated distribution and Bipolar distribution.</li><li>• Barriers and means of dispersal.</li><li>• Barrier and dispersal in Marine, Fresh water and Terrestrial environment.</li><li>• <b>Zoogeographical regions:</b> Palearctic, Nearctic, Neotropical, Oriental, Australian and Ethiopian regions - their Climatic and faunal peculiarities.</li><li>• Wallace line, Continental Drift.</li><li>• Biodiversity and hotspots of Biodiversity in India.</li></ul>	15
II	<b>Physiological Adaptations</b> <ul style="list-style-type: none"><li>• <b>Thermoregulation:</b> Ectothermy vs Endothermy, behavioral and physiological mechanisms for temperature regulation.</li><li>• <b>Water Regulation:</b> Osmoregulation in aquatic and terrestrial environments.</li><li>• <b>Excretory Adaptations:</b> Special adaptations to excrete metabolic waste efficiently in different habitats.</li><li>• <b>Metabolic Adaptations:</b> Hibernation, estivation, and energy storage mechanisms.</li><li>• <b>Case Studies:</b> Adaptations of desert and polar animals to extreme temperatures.</li></ul>	15
III	<b>Ecological Adaptations:</b> <ul style="list-style-type: none"><li>• <b>Terrestrial adaptations:</b><ul style="list-style-type: none"><li>• Limbs, body shape, and modifications for movement.</li></ul></li><li>• <b>Aquatic adaptations:</b><ul style="list-style-type: none"><li>• Primary and Secondary: Body shape, gill structures, and buoyancy mechanisms.</li></ul></li><li>• <b>Arboreal adaptations:</b> Limb modifications for climbing and grasping.</li><li>• <b>Fossorial (Borrowings) adaptations:</b> Limb modifications for burrowing.</li><li>• <b>Volant Adaptations:</b> Active flight and Passive Flight, Structural modifications of endoskeleton.</li></ul>	15







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Unit - IV Practical (s)	30 Hours
<ol style="list-style-type: none"><li>1. Study of Palearctic and Nearctic regions and identified specific fauna of respective regions through Map and multimedia.</li><li>2. Study of Neotropical and Oriental regions and identified specific fauna of respective regions through Map and multimedia.</li><li>3. Study of Australian and Ethiopian regions and identified specific fauna of respective regions through Map and multimedia.</li><li>4. To study Biodiversity and hotspots of Biodiversity in India through multimedia.</li><li>5. To study Metabolic Adaptation.</li><li>6. To study Aquatic Adaptation in Fish and Mammals.</li><li>7. To study Terrestrial adaptation.</li><li>8. To study Fossorial Adaptation.</li><li>9. To study Arboreal adaptation.</li><li>10. To study Volant adaptation in birds.</li></ol>	
<b>Textbooks</b>	
<ol style="list-style-type: none"><li>1. A Text-Book of Zoogeography by Frank E. Beddard, Forgotten Books Pub. 2018</li><li>2. Concepts of Zoogeography and Wildlife by Dr. Umesh Bharti and Dr. Ravneet Kaur, 2020</li><li>3. Concepts of Ecology (Environmental Biology) by N. Arumugam, Saras Publication</li><li>4. Ecology, Toxicology and Evolution N. Arumugam, Saras Publication</li><li>5. Developmental Zoology, Ecology, Animal Physiology &amp; Evolution by N. Arumugam, A. Mariakuttikan, Saras Publication</li><li>6. Wildlife Conservation and Management by N. Arumugam, T.C. Mahesh, Saras Publication</li></ol>	
<b>Reference Books</b>	
<ol style="list-style-type: none"><li>1. A Text-Book of Zoogeography by Frank Evers Beddard · 2015</li><li>2. Adaptation to Environment Essays on the Physiology of Marine Animals 1976</li><li>3. A Text-Book of Zoogeography by R. Lydekker 1985</li><li>4. Zoogeography: The Geographical Distribution of Animals by P.J. Darlington</li><li>5. Animal geography by Wilma George</li><li>6. Dynamic Zoogeography: With Special Reference to Land Animals by Udvardy, Miklos D F</li><li>7. Animal Adaptations Evolution of Forms and Functions by R. K. Saxena, Sumitra Saxena · 2015</li><li>8. Behavioral Adaptations of Desert Animals, Giovanni Costa. 2012</li><li>9. Fundamentals of World Zoogeography by S. K. Tiwari,</li><li>10. Ecology and Human Adaptation</li><li>11. Ecology and Zoogeography by Dr. Pathan Amjad khan Rudra Publication.</li></ol>	







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## School of Science

### B.Sc. (Zoology) Programme

**L::** Lecture, **T::** Tutorial, **P::** Practical

**CCE::** Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/surprised), attendance etc. or any combination of these)

**PWE::** Practical Work Examination (PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

**SEE::** Semester End Evaluation

