



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsamunda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmada

Established by Tribal Development Department, Govt. of Gujarat

School of Science B.Sc. (Zoology) Programme

Subject Code & Name: BS04MIZOO2 Aquatic Biology

Teaching and Evaluation Scheme:

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

Programme Name	B.Sc. Zoology
Semester	IV
Course Code	BS04MIZOO2
Course Title	Aquatic Biology
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

1. To provide a comprehensive understanding of aquatic ecosystems, including their biodiversity, ecology, and conservation.
2. To study about aquatic ecosystems and Its characteristics.
3. To understand the estuarine ecosystem and inland water habitats.
4. To get knowledge about fauna living in aquatic biomes.
5. To study the practical part of aquatic biology with examples.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Recognize scope and significance of Aquatic Biology and introduce the Limnology, Marine Biology and Oceanography.
2. Create awareness about the properties of freshwater and seawater, the elixir of life.
3. Understand and study different geomorphic formations of water bodies.
4. Give an insight to aquatic flora and fauna
5. Critically evaluate the pollution, its sources and eco-restoration of aquatic systems.





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Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	<ul style="list-style-type: none">• Significance and History of Marine Biology and Limnology.• Brief introduction of the aquatic biomes: Freshwater ecosystem (lakes, wetlands, streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs• Lakes: Origin and classification, Lake as an Ecosystem, Lake morphometry• Physico-chemical Characteristics of lake water: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases (Oxygen, Carbon dioxide).	15
II	<ul style="list-style-type: none">• Estuarine Biology: Classification and Characteristics of Estuaries. Estuaries, coastal wetlands and its Zonations. Major estuaries and backwaters in India. Mangrove and Saltmarsh ecosystems and biodiversity, its conservation and management. Mangrove ecosystem services.• Classification and characteristics of different inland water forms Lentic, Lotic and its zonal classification. Streams, Rivers, Ponds, Lakes, Swamps/Marshes, Springs, Wetlands and Reservoirs.	15
III	<ul style="list-style-type: none">• Classification of Aquatic Organisms Freshwater and Marine forms. Plankton (Phyto and Zooplankton), freshwater plants, sea grasses and weeds, nekton, neuston, periphyton and benthos.• Salinity and density of Sea water, Continental shelves, Adaptations of deep-sea organisms, Sea weeds.• Causes of pollution Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment, Water quality assessment- BOD and COD.	15





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Practical (s)

1. To Study Physico-chemical Characteristics of lake water.
2. To Study of zonation of Aquatic Ecosystem.
3. To Study Mangrove ecosystem.
4. To Study Classification and characteristics of different inland water forms
5. To Study Adaptations of deep-sea organisms.
6. To study Sewage treatment plant.
7. To Study Water quality assessment - BOD.
8. To Study Water quality assessment - COD.
9. To study the adaptations of deep-sea organisms
10. Identifications of zooplanktons from fresh waterbodies.

Text Book(s)

1. Bioresources Ecology 3rd Ed. Anatha Krishnan
2. Limnology, 2nd Edition by Goldman
3. Fundamentals of Ecology, 5th Ed. by Odum and Barrett
4. Physicochemical Methods for Water and Wastewater Treatment, 1st Ed., by Pawlowski
5. Limnology, 3rd Ed. By Wetzel
6. Chemical and biological methods for water pollution studies by Trivedi and Goyal
7. Limnology Vols. I-II by Welch

Reference Books

1. Barnes, R.S.K. 1974. Fundamentals of Aquatic Ecosystems, (R.S.K. Barnes & K.H. Mann, eds.), Blackwell Sci. Publ., London,
2. Bronmark, C. and L. Hansson. 1998. The Biology of Lakes and Ponds. Oxford University Press, New York.
3. Castro, P. and M.E. Huber, 1997. Marine Biology, Second Edition. Mc-Graw Hill Company.
4. Datta Munshi, J. and J.S. Datta Munshi, 1995. Fundamentals of Freshwater Biology. Narendra Publishing House, Delhi.
5. Edmondson, W.T. 1959. Freshwater Biology. Wiley Publ., NY,
6. Gross, G., 1993. Oceanography: A View of the Earth. Sixth Edition Prentice – Hall Inc., New Jersey.
7. Hutchinson, G.E. 1967. A Treatise on Limnology. Vols. 1 & 2. John Wiley & Sons, NY,
8. McCutcheon, S. and B. McCutcheon. 2003. The Facts on File. Marine Science Handbook. Facts on File, Inc., New York, 266pp.
9. Mitra, A., K. Banerjee and A. Gangopadhyay, 2013. Introduction to marine plankton. Daya Publishing House.
10. Odum, E.P. 1971. Ecology. Holt Riehart & Winston inc., USA, 152 pp.





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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

