



Shrimathi Devkunvar Nanalal Bhatt Vaishnav College For Women (Autonomous)

Owned and Managed by Cork Industries Charities Trust
Affiliated to University of Madras - Re-Accredited with 'A+' Grade by NAAC - 4th Cycle

COURSE DATASHEET

SEMESTER	I	BATCH	2026
COURSE NAME	Animal Biology	COURSE CODE	26UPBGE1001
COURSE UNITS	5	COURSE TYPE	Generic Elective(GE)-I
CONTACT HOURS (L-T-P)	3-1-2	CREDITS	3
OFFERED BY	Plant Biology and Plant Biotechnology	SHIFT(I)	Shift I -8:15 am-12:50pm

COURSE OBJECTIVES

1.	To understand the diversity of the animal kingdom by studying the basis of animal classification and the distinguishing characteristics of major animal phyla.
2.	To develop knowledge of biodiversity, its significance, global biodiversity hotspots, and the major threats affecting biological diversity.
3.	To recognize the principles and strategies of biodiversity conservation, including in-situ and ex-situ conservation methods, protected areas, and the importance of threatened, endemic, and keystone species.
4.	To acquire practical knowledge of vermiculture and vermicomposting techniques, environmental requirements, and entrepreneurial opportunities in organic waste management.
5.	To understand the fundamentals of aquaculture, including site selection, environmental considerations, harvesting techniques, and its role in sustainable food production and economic development.

COURSE OUTCOMES: On completion of the course the students will be able to...

	CO Statement	Cognitive Level
CO1	Explain the basis of animal classification and classify animals into major phyla based on Whittaker's classification and their diagnostic characteristics.	K1-K3 (Understand and Apply)
CO2	Describe biodiversity, analyze its importance, biodiversity hotspots, and evaluate the factors responsible for biodiversity loss.	K1-K5 (Understand, Analyze and Evaluate)
CO3	Differentiate between in-situ and ex-situ conservation strategies, interpret the significance of protected areas and IUCN categories, and	K1-K4 (Understand,



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	identify endangered, endemic, and keystone species.	Apply and Analyze)
CO4	Apply suitable vermiculture and vermicomposting techniques by selecting appropriate environmental conditions and assessing their role in sustainable agriculture and entrepreneurial development.	K1–K5 (Understand, Apply, Analyze and Evaluate)
CO5	Analyze aquaculture practices by evaluating site selection criteria, environmental impacts, water quality requirements, and demonstrating appropriate harvesting techniques for different aquaculture systems.	K1–K5 (Understand, Apply, Analyze and Evaluate)

SYLLABUS

UNIT	TOPICS	HOURS
1	Overview of the Animal Kingdom: Basis of Classification, Outline classification (Whittaker, 1969) with salient features of Different Phyla in the Animal Kingdom.	10 Hrs:
2	Biodiversity: Biodiversity: Definition, Importance of Biodiversity, Biodiversity Hotspots and Threats to Biodiversity.	10 Hrs:
3	Biodiversity Conservation: In – situ Conservation, Ex – situ Conservation, Protected Areas: Biosphere Reserves, National Parks and Wildlife Sanctuaries, Red Data Book and IUCN Categories: Endangered, Endemic and Keystone Species.	10 Hrs:
4	Vermiculture and Vermicomposting Techniques: Ideal environmental conditions for vermicomposting: temperature, moisture, aeration, pH and substrate quality. Methods of vermicomposting: Raised-bed method and Pot method. Entrepreneurship in Vermiculture.	15 Hrs:
5	Aquaculture: Introduction: Scope and definition, Importance, of aquaculture. Selection of sites for aquaculture: Land based farms, Open water farms, Water quantity and quality, Sources of pollution, Environmental impacts. Harvesting methods- Harvesting drainable ponds, Seining undrainable ponds, harvesting cage and raceway farm.	15 Hrs:
Note (if any)		60 Hrs:



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TEXT/REFERENCEBOOKS/E- RESOURCES:

Text Books	1. Agarwal, V. P. <i>et al.</i> (2023). A Textbook of Invertebrate Zoology, Brillion Publishing. 2. Rose Watson (1st Ed-2020). Invertebrate Zoology, Syrawood Publishing House.
	3. Vir Singh (2024). Textbook of Environment and Ecology. Springer Singapore. 4. Edwards, C.A., Arancon, N.Q., & Sherman, R. (1st Ed-2011). Vermiculture Technology, CRC Press. 5. Boyd, C.E. & Tucker, C.S. (2012) Pond Aquaculture Water Quality Management. Reprint Springer. 6. Pillay, T.V.R. & Kutty, M.N. (2nd Ed., 2005) Aquaculture: Principles and Practices. Wiley-Blackwell.
Books For Reference	1. Hickman, C.P., Keen, S.L., Larson, A., Eisenhour, D.J. (19th Ed., 2023). Integrated Principles of Zoology. McGraw-Hill. 2. Kardong, K.V. (8th Ed., 2022) Vertebrates: Comparative Anatomy, Function, Evolution. McGraw-Hill. 3. Cardinale, B.J. <i>et al.</i> (2012). Biodiversity loss and its impact on humanity. Journal: Nature 4. Blouin, M. <i>et al.</i> (2013). Earthworm impact on soil fertility. Journal: Soil Biology and Biochemistry. 5. Boyd, C.E. (2015). Water quality management in aquaculture. Journal: Aquaculture Engineering.
E-Learning Resources	1. https://www.iucnredlist.org 2. https://moef.gov.in 3. https://www.nacsa.org.in 4. https://nbaindia.org 5. https://www.cifa.nic.in 6. https://zsi.gov.in

PEDAGOGY (TEACHING METHODOLOGY):

- Lecture
- Chart
- Microscopic observation
- Specimens
- Spotters
- PPT and field study



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CO-POANDCO-PSOMAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	-	2	1	-	2	1	3
CO2	2	3	2	2	2	3	2	1	2
CO3	2	3	3	2	2	3	2	2	2
CO4	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3
Average (Useonly filled in cells for calculation)	2.6	2.8	2.2	2.2	2.2	2.2	2.4	2.2	2.6

CorrelationLevel:1-Low2-Moderate3-Strong

JUSTIFICATIONOFCO-PO/PSO MAPPING

CO	PO/PSO	Level of correlation	Justification
CO1	PO1	3	Developsstrongconceptualknowledgeinzoologyand classification of animals.
	PO2	2	Enhanceslogicalthinkingbycomparingdiagnostic features of animal phyla.
	PO3	0	No correlation
	PO4	2	Formstheacademicfoundationforhigherstudiesin zoology and life sciences.
	PO5	1	Encouragescontinuouslearningintaxonomyand biodiversity.
	PO6	0	No correlation
	PSO1	3	ProvidesfundamentalknowledgeofZoologyandanimal diversity.
	PSO2	2	Developsanalyticalskillsinidentifyingandclassifying organisms.
	PSO3	1	Basicknowledgesupportspreparationforcompetitive examinations.



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CO2	PO1	3	Strengthens understanding of biodiversity concepts.
	PO2	3	Promotes critical analysis of biodiversity issues.
	PO3	2	Encourages identification of conservation-related societal problems.
	PO4	2	Provides knowledge useful for advanced studies in environmental biology.
	PO5	2	Motivates lifelong learning on global environmental challenges.
	PO6	3	Develops ethical responsibility toward biodiversity conservation.
	PSO1	3	Enhances understanding of biodiversity.
	PSO2	2	Improves analytical skills in environmental assessment.
	PSO3	1	Supports competitive examination preparation.
CO3	PO1	3	Provides comprehensive knowledge of conservation biology.
	PO2	3	Develops analytical ability to compare conservation approaches.
	PO3	3	Enables students to propose conservation solutions for biodiversity protection.
	PO4	2	Supports specialization in wildlife and environmental sciences.
	PO5	2	Encourages lifelong engagement in conservation initiatives.
	PO6	3	Promotes ethical and environmental responsibility.
	PSO1	3	Reinforces biodiversity and conservation concepts.
	PSO2	2	Enhances analytical and research-oriented thinking.
	PSO3	2	Useful for careers in wildlife, forestry, and environmental services.
CO4	PO1	3	Applies zoological knowledge to sustainable agriculture.
	PO2	3	Evaluates environmental conditions for vermicomposting.
	PO3	3	Solves waste management problems through biological methods.
	PO4	2	Provides a foundation for higher studies in applied zoology.
	PO5	3	Encourages innovation and lifelong learning in sustainable technologies.



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	PO6	3	Promotes environmentally responsible and ethical practices.
	PSO1	3	Develops knowledge in vermiculture.
	PSO2	3	Builds practical and research skills.
	PSO3	3	Encourages entrepreneurship and employment opportunities.
CO5	PO1	3	Applies zoological principles in aquaculture practices.
	PO2	3	Evaluates environmental and technical aspects of aquaculture.
	PO3	3	Addresses challenges in sustainable aquaculture production.
	PO4	3	Supports advanced learning and specialization in fisheries and aquaculture.
	PO5	3	Promotes continuous learning in emerging aquaculture technologies.
	PO6	2	Encourages responsible management of aquatic resources.
	PSO1	3	Provides knowledge in aquaculture.
	PSO2	3	Develops practical, analytical, and research skills.
	PSO3	3	Enhances employability and entrepreneurial skills in aquaculture.



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COURSE DATASHEET

SEMESTER	I	BATCH	2026
COURSE NAME	ANIMAL BIOLOGY- PRACTICAL	COURSE CODE	26UPBGE1001
COURSE UNITS	5	COURSE TYPE	Generic Elective (GE)- Practical
CONTACT HOURS (L-T-P)	0-0-2	CREDITS	2
OFFERED BY	Plant Biology and Plant Biotechnology	SHIFT (I/II) Shift I-8:15am- 12:50 pm	Shift I-8:15am- 12:50 pm

COURSE OBJECTIVES

1.	To identify and classify selected invertebrates and vertebrates based on their external morphological characteristics and taxonomic features.
2.	To demonstrate practical skills in the preparation and maintenance of a vermicompost bed using organic waste and understand its role in sustainable waste management.
3.	To develop knowledge of biodiversity conservation by locating and marking major biodiversity hotspots, national parks and wildlife sanctuaries on the political map of India.
4.	To perform simple environmental quality assessment by measuring water quality parameters such as pH and Total Dissolved Solids.
5.	To recognize and identify common fish feeds and fish farming nets used in aquaculture.

COURSE OUTCOMES: On completion of the course the students will be able to...

	CO Statement	Cognitive Level
CO1	Identify and classify invertebrate and vertebrate specimens based on morphological characteristics.	K1-K3 (Understand, and determine)
CO2	Demonstrate vermicomposting techniques using organic waste and explain their environmental significance.	K1-K3 (Understand, and apply)
CO3	Locate and identify biodiversity hotspots, national parks, and wildlife sanctuaries on the political map of India.	K1-K3 (Understand)



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		recall,apply)
CO4	Perform water quality tests (pH and TDS) and interpret the results.	K1-K4 (Understand recall,analyze)
CO5	Identify fish farming nets and feeds and relate their uses to sustainable aquaculture practices.	K1-K3 (Understand recall,give example and identify)

SYLLABUS

UNIT	TOPICS	HOURS
1	Observation and identification of Microscopic permanent slides/ Macroscopic permanent specimens: Invertebrates: <i>Entamoeba</i> (Entire), <i>Sycon</i> (Entire), <i>Obelia geniculata</i> (Entire), <i>Taenia solium</i> (Entire), Leech (Entire), Mosquito (Entire), Fresh water mussel (Entire), <i>Sea star</i> (Entire) Vertebrates: Shark (Entire), <i>Cacopus</i> (Entire), Lizard (Entire) Pigeon (Entire) and Rabbit (Entire)	10 Hrs
2	Demonstration of Vermicompost bed using organic waste.	5 Hrs
3	Political map of India: marking hotspots, national parks and wildlife sanctuaries of India.	5 Hrs
4	Water Qualitative Test: pH and Total Dissolved Solids (TDS)	5 Hrs
5	Identification: of Fish farming nets and Fish feeds.	5 Hrs
Note (if any)		30 Hrs



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	3. Jordan, E. L. & Verma, P. S. <i>Chordate Zoology</i> 2019, 16th Edition S. Chand Publishing, New Delhi. 4. Edwards, C. A., Arancon, N. Q. & Sherman, R. <i>Vermiculture Technology: Earthworms, Organic Wastes, and Environmental Management</i> 2011, 1st Edition CRC Press, Boca Raton. 5. APHA (American Public Health Association) <i>Standard Methods for the Examination of Water and Wastewater</i> 2023, 24th Edition American Public Health Association, Washington, DC.
Books For Reference	1. Hickman, C. P., Keen, S. L., Eisenhour, D. J., Larson, A. & I'Anson, H. <i>Integrated Principles of Zoology</i> 2022, 19th Edition McGraw-Hill Education. 2. Nelson, J. S., Grande, T. C. & Wilson, M. V. H. <i>Fishes of the World</i> 2016, 5th Edition John Wiley & Sons. 3. Pillay, T. V. R. & Kutty, M. N. <i>Aquaculture: Principles and Practices</i> 2005, 2nd Edition Blackwell Publishing Ltd. 4. Kumar, A. <i>Environmental Science</i> 2022, 3rd Edition Ane Books Pvt. Ltd., New Delhi. 5. Khanna, D. R. & Bhutiani, R. <i>Laboratory Manual of Water and Wastewater Analysis</i> 2018, 1st Edition Daya Publishing House, New Delhi.
E-Learning Resources	1. https://en.wikipedia.org/wiki/National_Council_of_Educational_Research_and_Training 2. https://en.wikipedia.org/wiki/Zoological_Survey_of_India 3. https://cpcb.nic.in/ 4. https://www.fao.org/home/en 5. https://wii.gov.in/ 6. https://moef.gov.in/

PEDAGOGY (TEACHING METHODOLOGY):

- Chart
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CO1	3	2	-	2	1	-	3	3	1
CO2	3	2	3	1	2	3	3	2	2
CO3	2	2	2	1	2	3	3	2	1
CO4	3	3	2	2	2	2	2	3	2
CO5	3	2	2	2	2	2	3	3	3
Average (Use only filled in cells for calculation)	2.8	2.2	1.8	1.6	1.8	2	2.8	2.6	1.8

Correlation Level: 1-Low 2-Moderate 3-Strong

JUSTIFICATION OF CO-PO/PSO MAPPING

CO	PO/PSO	Level of correlation	Justification
CO1	PO1	3	Develops fundamental zoological knowledge and the ability to identify animal diversity using scientific concepts.
	PO2	2	Enhances observation, comparison and logical classification skills.
	PO3	0	No correlation
	PO4	2	Strengthens the foundation for higher studies in taxonomy, systematic and biodiversity.
	PO5	1	Encourages continuous learning of animal diversity and taxonomy.
	PO6	0	No correlation
	PSO1	3	Directly provides knowledge of basic zoology and biodiversity.
	PSO2	3	Develops practical identification and laboratory skills in animal science.
	PSO3	1	Offers basic knowledge useful for competitive examinations and career preparation.



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CO2	PO1	3	Applies biological concepts in sustainable waste management.
	PO2	2	Develops practical problem-solving and environmental awareness.
	PO3	3	Promotes sustainable solutions for organic waste disposal.
	PO4	1	Provides basic exposure to environmental management for advanced studies.
	PO5	2	Encourages lifelong learning in sustainable agricultural practices.
	PO6	3	Builds ethical responsibility towards environmental conservation.
	PSO1	3	Directly supports learning in vermiculture.
	PSO2	2	Develops practical laboratory and analytical skills.
	PSO3	2	Introduces entrepreneurial opportunities in organic farming and waste management.
CO3	PO1	2	Enhances understanding of biodiversity and conservation concepts.
	PO2	2	Develops analytical understanding of wildlife distribution and conservation.
	PO3	2	Promotes awareness of biodiversity conservation strategies.
	PO4	1	Supports further studies in wildlife biology and conservation.
	PO5	2	Encourages lifelong learning in environmental conservation.
	PO6	3	Instills ethical responsibility towards wildlife protection and biodiversity conservation.
	PSO1	3	Directly relates to biodiversity studies.
	PSO2	2	Improves practical and observational skills.
	PSO3	1	Provides foundational knowledge useful for competitive examinations.
CO4	PO1	3	Applies scientific principles to environmental analysis.



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	PO2	3	Strengthens analytical thinking and interpretation of experimental data.
	PO3	2	Contributes to solving environmental and public health issues.
	PO4	2	Develops laboratory competency for advanced studies.
	PO5	2	Encourages continuous learning in environmental monitoring techniques.
	PO6	2	Promotes responsible use and conservation of water resources.
	PSO1	2	Supports environmental aspects of zoology.
	PSO2	3	Develops laboratory, analytical and research skills.
	PSO3	2	Enhances employability through practical laboratory competence.
CO5	PO1	3	Applies zoological knowledge to aquaculture practices.
	PO2	2	Develops practical understanding of fish culture techniques.
	PO3	2	Promotes sustainable aquaculture for food security and livelihood.
	PO4	2	Builds a foundation for higher studies in fisheries and aquaculture.
	PO5	2	Encourages lifelong learning in fisheries technology.
	PO6	2	Promotes ethical and sustainable utilization of aquatic resources.
	PSO1	3	Directly addresses aquaculture concepts.
	PSO2	3	Enhances practical skills in fisheries science.
	PSO3	3	Supports entrepreneurship, employment opportunities and career development in aquaculture.