



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

M.Sc. (Zoology) Programme

Subject Code& Name: - MS02CZOO04 – Wildlife Biology and Conservation

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				Internal		External	
L	T	P	Total	TH	PWE	TH	PWE
2	--	2	4	25%	25%	25%	25%

Programme Name	M.Sc. Zoology
Semester	II
Course Code	MS02CZOO04
Course Title	Wildlife Biology and Conservation
Course Content Type (Th./Pr.)	Theory + Practical
Course Credit	4
Sessions+ Lab. Per Week	2+2
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

Upon completion of this course, students will be able to:

- To develop an understanding of wildlife ecology and ecosystem processes.
- To examine biodiversity threats and contemporary conservation strategies.
- To acquire practical skills in wildlife survey, monitoring, and conservation assessment.

Prerequisites (if any)

Students should have completed undergraduate courses in:

- Zoology/Biology/Ecology/Environmental Science.
- Basic concepts of Genetics, Evolution and Animal Diversity.
- Elementary Biostatistics and Scientific Methodology

Learning Outcomes

After successful completion of the course, students will be able to:

- Explain the diversity, ecology, and biogeographical distribution of wildlife in India.
- Assess wildlife populations, habitat quality and conservation status using standard field and analytical techniques.
- Develop scientifically informed conservation and management plans incorporating wildlife policies, protected area management and community participation.





बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Mūṇḁā Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science M.Sc. (Zoology) Programme

Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Fundamentals of Wildlife Biology, Biodiversity and Conservation Principles : • Concept, scope and significance of Wildlife Biology • Wildlife diversity and biogeographic zones of India • Keystone, flagship, umbrella and indicator species Biodiversity • Introduction and types of biodiversity. • Threats to wildlife: Habitat loss and fragmentation, Climate change, Invasive species, Wildlife diseases, Human-wildlife conflict • IUCN Red List categories and criteria • Biodiversity hotspots with special reference to India • Conservation genetics and importance of genetic diversity	15
II	Wildlife Management and Monitoring : • Wildlife census and monitoring methods • Population estimation: Direct and indirect methods, Line transect sampling, Distance sampling, Camera trapping, and Mark-recapture techniques • Habitat evaluation and management Conservation Policies, Protected Areas and Community Participation : • In-situ and Ex-situ conservation • Protected Area Network: National Parks, Wildlife Sanctuaries, Conservation Reserves, Community Reserves and Biosphere Reserves • Wildlife (Protection) Act, 1972 (amended) • Biological Diversity Act, 2002 • CITES, CBD, Ramsar Convention and CMS • Community-based conservation • Ecotourism and sustainable wildlife management • Case studies: Project Tiger, Project Elephant, Asiatic Lion Conservation and Crocodile Conservation Programme	15



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science M.Sc. (Zoology) Programme

Practical(s) (if any)	
List of Practical (Practical are demonstrated using charts, models and multimedia videos) A. Laboratory and Field Exercises: 1. Mapping of Indian biogeographic zones, protected areas and biodiversity hotspots using Map. 2. Estimation of species richness and calculation of biodiversity indices (Shannon–Wiener, Simpson's Index). 3. Population estimation using quadrat, line transect and point count methods. 4. Habitat assessment through vegetation sampling and analysis of habitat variables. 5. Assessment of wildlife conservation status using IUCN Red List criteria and databases. 6. Analysis of human–wildlife conflict case studies and mitigation strategies. 7. Interpretation of wildlife census data and population trends. 8. Demonstration of camera traps and their applications in wildlife monitoring. 9. Demonstration of GPS operation and field navigation techniques. 10. Demonstration of GIS and Remote Sensing tools for wildlife habitat mapping. 11. Demonstration of radio-telemetry and animal tracking techniques. 12. Demonstration of wildlife forensic tools and identification of animal derivatives. 13. Demonstration of drone applications in wildlife surveys and habitat monitoring. 14. Demonstration of molecular tools used in conservation genetics and wildlife DNA analysis. 15. Analysis of wildlife population data using spreadsheet/statistical software. B. Field-Based Activities : 1. Field visit to a National Park, Wildlife Sanctuary, Biodiversity Park, Zoological Park, Rescue Centre or Important Bird Area. 2. Wildlife survey using transect or point count methods during field visits. 3. Habitat characterization and biodiversity documentation of a selected site. 4. Preparation and submission of a field report based on wildlife observations and conservation assessment.	60 hours





बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science M.Sc. (Zoology) Programme

Text Book(s)

1. Fundamentals of Wildlife Management by Rajesh Gopal; Justice Home Publications, New Delhi.
2. Wildlife Ecology in India by Mahesh Rangarajan & Ghazala Shahabuddin; Permanent Black, New Delhi.
3. The Book of Indian Animals by S.H. Prater; Bombay Natural History Society (BNHS), Mumbai.
4. India's Wildlife and Wildlife Reserves by Anwaruddin Choudhury; Oxford University Press, New Delhi.
5. Biodiversity and Conservation by K.C. Agrawal; Nidhi Publishers, Bikaner.
6. Wildlife Management in India by V.B. Saharia; Natraj Publishers, Dehradun.
7. Ecology and Environment by P.D. Sharma; Rastogi Publications, Meerut.
8. Environmental Biology and Wildlife Conservation by P.S. Verma & V.K. Agarwal; S. Chand Publishing, New Delhi.

Reference Books

1. Planning a Wildlife Protected Area Network for India – W.A. Rodgers, H.S. Panwar & V.B. Mathur; Wildlife Institute of India, Dehradun.
2. India's Wildlife History: An Introduction – Mahesh Rangarajan; Permanent Black, New Delhi.
3. India's Wildlife – M. Krishnan; Bombay Natural History Society, Mumbai.
4. Endangered Animals of India and Their Conservation – S.M. Nair; National Book Trust, New Delhi.
5. Birds of the Indian Subcontinent – Richard Grimmett, Carol Inskipp & Tim Inskipp; Oxford University Press, New Delhi.
6. Mammals of South Asia – A.J.T. Johnsingh & N. Manjrekar; Universities Press, Hyderabad.
7. A Field Guide to Indian Mammals – Vivek Menon; Hachette India, New Delhi.
8. Essentials of Conservation Biology – Richard B. Primack; Sinauer Associates/Oxford University Press.
9. Conservation Biology: Foundations, Concepts, Applications – Fred Van Dyke & Rachel Lamb; Springer Nature.
10. Wildlife Ecology, Conservation and Management – Anthony R.E. Sinclair, John M. Fryxell & Graeme Caughley; Wiley-Blackwell.
11. Wildlife Ecology, Management and Conservation – James T. Peterson, Michael J. Conroy & Matt W. Wolfe; Johns Hopkins University Press.
12. Wildlife Biology – Raymond F. Dasmann; Wiley Publications.
13. Ecological Methods – T.R.E. Southwood & P.A. Henderson; Wiley-Blackwell.
14. A Primer of Conservation Biology – Richard B. Primack; Sinauer Associates.
15. Introduction to Conservation Genetics – Richard Frankham, Jonathan D. Ballou & David A. Briscoe; Cambridge University Press.



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science M.Sc. (Zoology) Programme

Web Resources

- Wildlife Institute of India (WII): <https://wii.gov.in>
- National Biodiversity Authority (NBA): <https://nbaindia.org>
- Ministry of Environment, Forest and Climate Change (MoEFCC): <https://moef.gov.in>
- Bombay Natural History Society (BNHS): <https://www.bnhs.org>
- Zoological Survey of India (ZSI): <https://zsi.gov.in>
- Forest Survey of India (FSI): <https://fsi.nic.in>
- India Biodiversity Portal: <https://indiabiodiversity.org>
- Wildlife Crime Control Bureau (WCCB): <https://wccb.gov.in>
- IUCN Red List of Threatened Species: <https://www.iucnredlist.org>
- International Union for Conservation of Nature (IUCN): <https://www.iucn.org>
- Convention on Biological Diversity (CBD): <https://www.cbd.int>
- Convention on International Trade in Endangered Species (CITES): <https://cites.org>
- Ramsar Convention on Wetlands: <https://www.ramsar.org>
- Global Biodiversity Information Facility (GBIF): <https://www.gbif.org>
- World Wildlife Fund (WWF): <https://www.worldwildlife.org>
- United Nations Environment Programme (UNEP): <https://www.unep.org>

Required Software(s) (if any)

PAST (Paleontological Statistics Software Package)

- Free software widely used for biodiversity indices, ecological statistics, ordination, cluster analysis, and rarefaction.
- Link: <https://www.nhm.uio.no/english/research/resources/past/>

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

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)